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11/01/2003

UMLS® KNOWLEDGE SOURCES

14th Edition - November Release

2003AC

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SECTION 0.

INTRODUCTION TO THE UMLS

0.1 What's New for the 2003AC UMLS

* Notice: 2003 APPENDIX TO THE LICENSE FOR USE OF THE UMLS PRODUCTS

Included in the documentation is a copy of the 2003 [Appendix](#) to the License Agreement for the UMLS Products. The License Agreement and the current Appendix are also available on NLM's Web site at:

<http://www.nlm.nih.gov/research/umls/license.html>

Please read the Appendix carefully. Continued use of the UMLS products under the terms of your original License requires that you have read the information in the 2003 Appendix to the License for Use of the UMLS Products.

Continued use of the UMLS means that you agree and accept that the quarterly updated Appendix is part of the License Agreement and that you are responsible for adhering to any additional restrictions on use of some of the source vocabularies contained in the Metathesaurus that are described in the Appendix. An explanation of the meaning of the various categories of restrictions appears in the body of the license agreement.

0.1.0 Introduction

Please note that the UMLS Knowledge Sources are created for developers and are not end-user applications. Significant intellectual effort and computing resources may be required to understand and use them correctly!

E-mail questions about the UMLS should go to custserv@nlm.nih.gov. Telephone questions go to 1-888-FINDNLM (1-888-346-3656).

Here are four further resources for UMLS information:

1.) UMLS Knowledge Source Server: <http://umlsks.nlm.nih.gov>

The UMLS Knowledge Source Server provides the full UMLS data. It is open to anyone who has signed the UMLS License Agreement (<http://www.nlm.nih.gov/research/umls/license.html>) and has received a license number. First time users should establish a login and a password through the online registration at the web site. Any questions or problems should be addressed via email to umlsks@nlm.nih.gov.

2.) Umlsinfo: <http://umlsinfo.nlm.nih.gov>

This site provides helpful information - documentation, FAQs, learning resources including tutorials, bonus files, sample load scripts, and more. It is an evolving resource; please give us feedback. This site does not contain proprietary information and so does not require a UMLS license.

3.) Umls-users listserv

UMLS users can subscribe to a listserv to discuss UMLS issues. To subscribe to the listserv, simply send a message to listserv@nlm.nih.gov which includes the following line:

```
subscribe umls-users <your full name>
```

To post a message to the umls-users listserv AFTER subscribing, send email to:

umls-users@lhcnlm.nih.gov

4.) Lexical Tools documentation is available at: <http://umlslex.nlm.nih.gov/>

Release Names:

To allow for multiple releases each year, releases are named in the format: YYYYVV_SS, where:

- YYYY is a 4 digit year, e.g., 2003
- VV is a two letter designation for the version ID starting with "AA", e.g., 2003AA
- SS is a subset ID where needed (e.g., "2")

The first release of the year (called a January release) will have the version ID of "AA". Subsequent releases for that year will have a version ID of "AB", "AC", etc.

Releases that are created as subsets using MetamorphoSys should have a subset ID designation starting with 1 and counting up.

Examples:

- 2002AA -> January release for 2002
- 2002AC -> third release (AC) for 2002

Compact Disc Names:

Discs are named for release and type, for example:

2002AA_ZIP
 2002AB_TAR
 2002AC_2_TAR

(Note: these names will work even when they include the subset number, e.g. 2002AC_2_TAR)

Compressed file names:

The ZIP and TAR compressed files are named for the release with a ZIP or TAR extension, for example:

2002AB.ZIP
 2002AC_2.TAR

0.1.1 Metathesaurus

The 2003AC edition of the Metathesaurus includes 975,354 concepts and 2.4 million concept names in its source vocabularies. 68.1% of concepts have no added restrictions. Compared to January's release, there are 74,803 more concepts with 124,923 more names in MRCON from 102 sources, counted as the number of source families by language.

The following describes what is new in the Metathesaurus since the 2003AC release:

There were no new sources added to the 2003AC Metathesaurus.

Eleven sources were updated for 2003AC: CCS2003 - Clinical Classifications Software; CPM2003 - Columbia Presbyterian Medical Center Medical Entities Dictionary; ICD9CM_2004 - International Classification of Diseases: 9th revision, Clinical Modification (ICD-9-CM); MDDDB_2003_03 - Master Drug Data Base; MDRSPA60rev - MedDRA Spanish edition; MSH2004_2003_08_08 - Medical Subject Headings (MeSH); MTHICD9_2004 - Metathesaurus additional entry terms for the International Classification of Diseases: 9th revision, Clinical Modification; NCBI2003 - NCBI Taxonomy; RXNORM_03AC - RxNorm work done by NLM; UWDA173 - University of Washington Digital Anatomist; VANDF03 - U.S. Department of Veterans Affairs, Veterans Health Administration National Drug File.

The source CPM2003 - Columbia Presbyterian Medical Center Medical Entities Dictionary now has full context (CPM||FULL-MULTIPLE; see Section 2.3.2 Contexts in the Metathesaurus).

For the MRSAB file there are two new fields, VSTART and VEND with this 2003AC edition.

VSTART|Valid start date for a source||0|0.17|10|MRSAB|char(10)|

VEND|Valid end date for a source||0|0.08|10|MRSAB|char(8)|

The MSTART and MEND fields, Metathesaurus start date and Metathesaurus end date, respectively, were removed from the MRSAB file in this 2003AC release.

There are four new Metathesaurus Attributes (DIV and RANK for NCBI2003, and ORIG_CODE and ORIG_SOURCE for RXNORM). No Attributes were discontinued for 2003AC. "Similar" in the Relationship Attributes no longer occurs in this edition.

Tommy G. Thompson, Secretary of Health and Human Services, announced on July 1, 2003, an agreement with the College of American Pathologists (CAP) that will make SNOMED Clinical Terms® (SNOMED CT®) available to U.S. users at no cost through the National Library of Medicine's Unified Medical Language System® (UMLS). For more information point your Web browser to: http://www.nlm.nih.gov/research/umls/Snomed/snomed_announcement.html

There will be a subsequent release of the 2003AC edition of the UMLS Metathesaurus expected in December 2003, in which the Metathesaurus release file structure will be substantially expanded. The old file structure will continue to be available as an output option of MetamorphoSys, the tools to customize and create subsets of the Metathesaurus that is distributed with the UMLS files (Section 2.8).

MetamorphoSys will have several file output options: the current relational file format, the new expanded relational file format, and (in 2004) XML format.

NLM expects to release SNOMED CT® in the new expanded (Rich Release) relational file format.

For more information on these upcoming changes, point your Web browser to the NLM whitepaper: http://www.nlm.nih.gov/research/umls/white_paper.html

MetamorphoSys

We remind users to use MetamorphoSys, software which allows UMLS users to exclude any vocabulary which is not helpful in their applications or for which they have not negotiated the additional license arrangements required by the license agreement for their intended uses of the Metathesaurus. MetamorphoSys may also be used to create a customized version of the Metathesaurus files with added suppressibility and/or employing a user-defined order of precedence to determine the preferred name of any UMLS concept.

For the 2003AC MetamorphoSys, the RXNORM filter is automatically included. This filter is designed to yield the subset of the Metathesaurus directly associated with RXNORM content. The specific algorithm restricts to concepts having one of the following three types of content:

1. A "Drug Delivery Device" semantic type.
2. Content with an RXNORM source abbreviation.
3. Content with an HL7 source abbreviation and a DF term type.

Please note that since RXNORM itself does not contain full contexts, the MRCXT output file will be empty.

For more information, please consult the README_MMS.txt file contained in the 2003AC release.

RxNORM Project

This release continues the creation and refinement of concepts to support the RxNorm Project. These concepts relate the names of orderable medications to a dose forms from a set proposed by the HL7 Vocabulary Technical Committee as a value set, and the components of those medications. For further discussion, see the article at:

<http://umlsinfo.nlm.nih.gov/RxNorm.html>

0.1.2 Semantic Network

No changes for the 2003AC edition. Some changes made to the Semantic Network for 2003AB include:

- 1) Addition of a 4-letter abbreviation for STYs (similar to the 2-letter abbreviation for RLs) in the 9th column (ABR) of SRDEF
- 2) Updated the examples for 21 STYs (SRDEF)
- 3) Added the transitive closure on the relationships to SRSTRE*, making SRSTRE* a fully expanded version of SRSTR
- 4) Removed from SRSTRE2 inverse relations involving "symmetrical" relationships(e.g., B adjacent_to A, for A adjacent_to B), making SRSTRE* consistent with SRSTR (no inverses)

The total number of Semantic Types in the 2003AC edition is 135, the total number of relationships is 54.

0.1.3 SPECIALIST Lexicon and Lexical Programs

The 2003 release of the lexicon will include over 183,000 lexical entries covering more than 292,000 strings.

For more information, see:

<http://umlslex.nlm.nih.gov/>

0.1.4 UMLS Knowledge Source Server

To find out more about the UMLS Knowledge Source Server, please go to:

<http://umlsks.nlm.nih.gov>

This page has a section on What's New and a link to a FAQ page.

0.2 Introduction to the UMLS Documentation

Note: The latest and most authoritative documentation is always available at:

<http://www.nlm.nih.gov/research/umls/UMLSDOC.HTML>

Please consult this and other NLM Web resources for updates and additional information.

This documentation provides information about the Unified Medical Language System (UMLS) Knowledge Sources and related lexical programs. The Metathesaurus, the Semantic Network, and the SPECIALIST lexicon are products of the U. S. National Library of Medicine. These Knowledge Sources are designed primarily for use by system developers. They are meant to be consulted and used by applications programs to interpret and refine user queries, to map the user's terms to appropriate controlled vocabularies and classification schemes, to interpret natural language, and to assist in structured

data creation. They are also useful as reference tools for database builders, librarians and other information professionals.

The documentation is arranged as follows:

What's New for the 2003AC UMLS ([Section 0](#))

Introduction to the entire UMLS project ([Section 1](#))

Metathesaurus ([Section 2](#))

Semantic Network ([Section 3](#))

SPECIALIST lexicon and related lexical software tools ([Section 4](#))

Using the UMLS Knowledge Source Server via the Internet ([Section 5](#))

Using the UMLS CD-ROMs ([Section 6](#))

More detailed information concerning some items discussed in the manual sections above is included in the Appendices.

To obtain access to the UMLS Knowledge Sources, you must sign a license agreement. Information regarding the license agreement can be found in [Appendix A](#). A copy of the license agreement is available with this documentation: [2003 License Agreement](#).

If there are questions on the use of the UMLS Knowledge Sources, the following resources are available:

UMLS users can subscribe to a listserv to discuss UMLS issues. To subscribe to the listserv, simply send a message to listserv@nlm.nih.gov which includes the following line:

```
subscribe umls-users <your full name>
```

To post a message to the umls-users listserv AFTER subscribing, send email to umls-users@lhc.nlm.nih.gov

Questions concerning the UMLS Knowledge Sources can be sent to custserv@nlm.nih.gov

Questions concerning the Knowledge Source Server can be sent to umlsks@nlm.nih.gov

A Web site has been developed to assist UMLS users and potential UMLS users in gaining more information on the UMLS Knowledge Sources.

<http://umlsinfo.nlm.nih.gov/>

This site offers FAQs, other information, learning resources, and some examples. Use does not require a signed UMLS license agreement, since it does not provide access to information from vocabulary providers.

SECTION 1

OVERVIEW OF THE UMLS PROJECT

1.1 Purpose

The UMLS project is a long-term NLM research and development effort designed to facilitate the retrieval and integration of information from multiple machine-readable biomedical information sources. The sources of interest include: descriptions of the biomedical literature, clinical records, factual databanks, knowledge-based systems, and directories of people and organizations. Major barriers to effective retrieval and integration of information from these sources include (1) the variety of vocabularies and classifications used in different sources and by different users and (2) the sheer number and wide distribution of potentially relevant information sources. These barriers deter health professionals and researchers from using available machine-readable information and also hamper the development of effective search interfaces that might assist these users.

1.2 The Knowledge Sources Development Strategy

The UMLS approach involves the development of "intellectual middleware" in the form of machine-readable "Knowledge Sources" that can be used by a wide variety of applications programs to compensate for differences in the way concepts are expressed in different machine-readable sources and by different users. The goal is to make it easier to develop systems that link information from patient record systems, bibliographic databases, factual databases, expert systems, etc. The UMLS Knowledge Sources can also facilitate the development of data creation and indexing applications.

There are three UMLS Knowledge Sources, which are the following: The Metathesaurus ([Section 2](#)) contains semantic information about biomedical concepts, their various names, and the relationships among them. It is built from thesauri, classifications, coding systems, and lists of controlled terms that are developed and maintained by many different organizations. It contains and interconnects many standard clinical and biomedical vocabularies including those proposed as national standards under the administrative simplification provisions of the Health Insurance Portability and Accountability Act of 1996 (HIPAA). The Semantic Network ([Section 3](#)) is a network of the general categories or semantic types to which all concepts in the Metathesaurus have been assigned. The SPECIALIST lexicon ([Section 4](#)) contains syntactic information about biomedical terms and will eventually cover the majority of component terms in the concept names present in the Metathesaurus. A number of lexical programs are distributed with the UMLS Knowledge Sources for use with the lexicon and the Metathesaurus; these are powerful tools for searching, indexing, and lexical processing.

The UMLS project is directed by a multi-disciplinary team of NLM staff and also involves research contractors. Apelon (the merger of Lexical Technology Inc. and Ontyx) has been instrumental in the development of the structure of the Metathesaurus and the system used to build and maintain it. More than 1500 institutions and individuals around the world have licensed the UMLS Knowledge Sources and are applying them in a variety of applications and research projects. NLM itself makes use of the UMLS Metathesaurus in the NLM Gateway and PubMed to enhance MEDLINE searching. NLM's ClinicalTrials.gov (<http://clinicaltrials.gov/>) uses the UMLS to automatically add words related to search terms entered and the Indexing Initiative (<http://ii.nlm.nih.gov>) uses the UMLS as a major component in investigating automated indexing methods.

The strategy for the development of all UMLS components is to build successive approximations of the capabilities ultimately desired. The current edition of the UMLS Knowledge Sources supersedes the previous edition and includes substantial additional content.

1.3 Sources of Additional Information

Current Fact Sheets on the UMLS project, each of the three UMLS Knowledge Sources, the UMLS Knowledge Source Server, and NLM applications and research projects that make use of the UMLS Knowledge Sources are available from NLM's World Wide Web Server: <http://www.nlm.nih.gov>. The server also includes a comprehensive bibliography on the UMLS project covering papers published from 1986-96 and pointers to information about some of the UMLS applications developed by other institutions. Recent relevant articles can be retrieved in MEDLINE under the subject heading Unified Medical Language System.

A Web site has been developed to assist UMLS users and potential UMLS users in gaining more information on the UMLS Knowledge Sources.

<http://umlsinfo.nlm.nih.gov/>

This site offers FAQs, other information, learning resources, and some examples. Use does not require a signed UMLS license agreement, since it does not provide access to information from vocabulary providers.

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SECTION 2

METATHESAURUS®

2.0 INTRODUCTION

The Metathesaurus is the central vocabulary component of the UMLS®. The term Metathesaurus draws on Webster's Dictionary third definition for the prefix "Meta," i.e., "more comprehensive, transcending." In a sense, the Metathesaurus transcends the specific vocabularies and classifications it encompasses.

The Metathesaurus is a database of information on concepts that appear in one or more of a number of different controlled vocabularies and classifications used in the field of biomedicine. In general, the scope of the Metathesaurus is determined by the combined scope of its source vocabularies. **The Metathesaurus preserves the meanings, attributes, hierarchical connections, and other relationships between terms present in its source vocabularies, while adding certain basic information about each of its concepts and establishing synonymy and new relationships between concepts and terms from different source vocabularies.**

The Metathesaurus is used in a wide range of applications including: information retrieval from databases with human assigned subject index terms and from free-text information sources; linking patient records to related information in bibliographic, full-text, or factual databases; natural language processing and automated indexing research; and structured data entry. In many cases, the utility of the Metathesaurus is enhanced when it is used in combination with the SPECIALIST lexicon, the lexical programs, and the Semantic Network. To obtain coherent, comparable results in data creation applications, such as patient data entry, it is necessary to define which Metathesaurus concepts and terms can be included in the records being created. This may be done by selecting one or more of the many Metathesaurus source vocabularies which provide the most appropriate concepts and terms for the specific data being created. Other Metathesaurus concepts and terms will then provide synonyms and related terms which can help to lead users to the vocabulary selected for a particular data creation application.

2.1 SOURCE VOCABULARIES

The Metathesaurus contains concepts and concept names from more than 100 vocabularies and classifications, some in multiple editions. (A complete list of the current Metathesaurus source vocabularies appears in [Appendix B, Section B.2.](#)) Many of the source vocabularies are included in their entirety; for others the Metathesaurus has partial coverage. (The number of concept names from each source is detailed in [Appendix B, Section B.3.](#)) Some material in the UMLS Metathesaurus is from [copyrighted sources](#) of the respective copyright claimants.

The Metathesaurus source vocabularies include terminologies designed for use in patient-record systems; large disease and procedure classifications used for statistical reporting and billing; more narrowly focused vocabularies used to record data related to psychiatry, nursing, medical devices, adverse drug reactions, etc.; disease and finding terminologies from expert diagnostic systems, and some thesauri used in information retrieval.

The Metathesaurus structure can incorporate translations of its source vocabularies into languages other than English. The 2003AC Metathesaurus includes the Dutch, French, Finnish, German, Italian, Portuguese, Russian (transliterated), and Spanish translations of NLM's Medical Subject Headings (MeSH). This edition also includes German translations of ICD10 and UMDNS; ICPC terms in Basque, Danish, Dutch, Finnish, French, German, Hebrew, Hungarian, Italian, Norwegian, Spanish, and Swedish; CPT terms in Spanish; Metathesaurus Version of Minimal Standard Terminology Digestive Endoscopy in French and Italian; WHOART terms in French, German, Portuguese, and Spanish; and MedDRA terms in Spanish and Portuguese.

Users should determine which vocabularies are useful for their purposes, and which vocabularies would require additional license arrangements for use. MetamorphoSys (see [Section 2.8](#)) should be used to exclude vocabularies; it removes all vocabulary information and thus ensures compliance with the UMLS License Agreement.

2.2 ORGANIZATION BY CONCEPT

The Metathesaurus is organized by concept or meaning. In essence, its purpose is to link alternative names and views of the same concept together and to identify useful relationships between different concepts. Each concept or meaning in the Metathesaurus has a unique concept identifier ([CUI](#)) which itself has no intrinsic meaning. Each unique concept name or string in each language in the Metathesaurus has a unique string identifier ([SUI](#)). Any variation in upper-lower case is a separate string, with a separate SUI. The same string in different languages (e.g., English and Spanish) will have a different string identifier for each language. For English language entries in the Metathesaurus only, each string is linked to all of its lexical variants or minor variations by means of a common term identifier ([LUI](#)). (In the Metathesaurus, therefore, an English "term" is the group of all strings that are lexical variants of each other.) All string and term identifiers are linked to at least one concept identifier. Different terms with the same meaning are linked to the same concept identifier. Thus, in the Metathesaurus, strings are linked to terms and both strings and terms are linked to concepts.

FIGURE 1.

Concept (CUI)	Terms (LUIs)	Strings (SUIs)
C0004238 Atrial Fibrillation (preferred) Atrial Fibrillations Auricular Fibrillation Auricular Fibrillations	L0004238 Atrial Fibrillation (preferred) Atrial Fibrillations	S0016668 Atrial Fibrillation (preferred)
		S0016669 Atrial Fibrillations
	L0004327 (synonym) Auricular Fibrillation Auricular Fibrillations	S0016899 Auricular Fibrillation (preferred)
		S0016900 (plural variant) Auricular Fibrillations

For example, in Figure 1, the string "Atrial Fibrillation" and its plural "Atrial Fibrillations" have different string identifiers, but are linked to the same term identifier. "Auricular Fibrillation" and its plural "Auricular Fibrillations" are linked to a different term identifier. Since "Atrial Fibrillation" and "Auricular Fibrillation" have been judged to have the same meaning, their different term identifiers are linked to the same concept identifier. Note that users may select preferred concept names by source; see [Section 2.8](#).

2.2.1 ORDER OF PRECEDENCE AMONG CONCEPT NAMES

Users of the Metathesaurus should configure their applications to feature terminology from the source vocabularies most appropriate to their user populations. For example, concept names from SNOMED International might be preferred in some clinical applications, and terminology from MeSH might be preferred in some literature retrieval systems. The source information provided in the Metathesaurus allows different applications to pick different preferred names for the same concepts; [MetamorphoSys \(Section 2.8\)](#) can be used to make this change.

As a convenience for those who build the Metathesaurus, one string from each term is designated as the default preferred name in the Metathesaurus. For example, in Figure 1: -"Atrial Fibrillation" is labeled as the preferred form of its term; -"Atrial Fibrillations" is labeled as a plural variant of this preferred term; -"Auricular Fibrillation" is labeled as the preferred form of its term; -"Auricular Fibrillations" is labeled as a plural variant of this preferred form. One of the terms is designated as the preferred name of the concept as a whole. In this case, the "Atrial Fibrillation" term is designated as the preferred term and therefore its preferred form, "Atrial Fibrillation," is the default preferred name of the concept in the Metathesaurus.

To avoid laborious selection among alternative terms and forms of terms, selection of the default preferred name for any Metathesaurus concept is based on an order of precedence of Metathesaurus source vocabularies. Different types of strings, e.g., preferred terms, cross references, abbreviations, from the same vocabulary will have different positions in this order. The factors considered in establishing the order include breadth of subject coverage, frequency of update, and the degree to which the source's concept names are used in regular clinical or biomedical discourse. The order of precedence used appears in [Appendix B, Section B.5](#)

2.2.2 STRINGS WITH MULTIPLE MEANINGS

In a small number of cases, the same string (ignoring differences in upper-lower case) may name different concepts, usually in different Metathesaurus source vocabularies. In the abbreviated example that follows, the string "Cold" is a name for the temperature in one vocabulary. In another vocabulary, "Cold" is an alternate name for the "Common cold". In a third Vocabulary, "COLD" is an acronym for "chronic obstructive lung disease". As a result, "Cold" or "COLD" appears as a name of at least three different concepts in the Metathesaurus. As illustrated in the sample in Figure 2, three distinct strings, "Cold <1>", "Cold <2>" and "COLD<3>" have been created for the Metathesaurus to give each meaning a unique name. Each of these strings is linked to only one concept. The plain strings "Cold" and "COLD" have explicit "ambiguous string" indicators in the Metathesaurus. More descriptive names have also been created by Metathesaurus editors to distinguish some of the strings with multiple meanings, e.g., "cold temperature". These names are identified by the term group "PN".

FIGURE 2.

<u>Concepts (CUIs)</u>	<u>Terms (LUIs)</u>	<u>Strings (SUIs)</u>
C0009264 cold temperature	L0215040 cold temperature	S0288775 cold temperature
	L0009264 Cold <1> Cold	S0007170 Cold <1>
		S0026353 Cold
C0009443 Common Cold	L0009443 Common Cold	S0026747 Common Cold
	L0009264 Cold <2> Cold	S0007171 Cold <2>
		S0026353 Cold
C0024117 Chronic Obstructive Airway Disease	L0498186 Chronic Obstructive Airway Disease	S0837575 Chronic Obstructive Airway Disease
	L0008703 Chronic Obstructive Lung Disease	S0837576 Chronic Obstructive Lung Disease

	L0009264 COLD <3> COLD	S0829315 COLD <3>
		S0474508 COLD

2.3 RELATIONSHIPS BETWEEN DIFFERENT CONCEPTS

The Metathesaurus also represents several types of relationships between different concepts. Many relationships are derived directly from the source vocabularies. For example, the fact that there is a relationship between "Atrial Fibrillation" and "Arrhythmia" is derived from the hierarchical tree structures in the Medical Subject Headings (MeSH). The exact nature of the relationship, i.e., "Atrial Fibrillation" is_a "Arrhythmia", is not yet present in MeSH, but was added during the construction of the Metathesaurus. Relationships between concepts from different source vocabularies were also created during Metathesaurus construction. For example, the COSTAR concept "Paroxysmal Atrial Fibrillation" is identified in the Metathesaurus as having a narrower-than relationship to "Atrial Fibrillation", a concept that is present in MeSH, ICD-9-CM, SNOMED, and COSTAR, etc.

2.3.1 RELATIONSHIPS IN THE METATHESAURUS

Relationships in the Metathesaurus may come from the sources themselves or may be created by Metathesaurus editors to link concepts that would not otherwise be connected. Some relationships (RELS) are further refined by a Relationship Attribute ([RELA](#), see Appendix B.1.1).

Note that the nature and purpose of a relationship depends on its source, as indicated in the "Source Abbreviation for source vocabulary" ([SAB](#)) and the "Source of Relationship labels," ([SL](#)). The source is the authority that asserts a relationship that is represented as transparently as possible within the Metathesaurus. Thus, relationships may adhere to pragmatic or esoteric principles; some are co-occurrences, statistical relationships, or mappings; some may even be self-referential (CUI1 = CUI2) where there are differing views of synonymy. Therefore it is important to select the RELs, RELAs, SABs, and SLs that match a user's views and purposes. Note also that a variety of relationships from earlier editions of the Metathesaurus as well as editor-asserted relationships may carry the SAB and/or SL of "MTH."

There are eleven types of relationships that exist in the Metathesaurus.

Broader (RB)	has a broader relationship.
Narrower (RN)	has a narrower relationship.
Other related (RO)	has relationship other than synonymous, narrower, or broader.
Like (RL)	the two concepts are similar or "alike". In the current edition of the Metathesaurus, most relationships with this attribute are mappings provided by a source.
RQ	unspecified source asserted relatedness, possibly synonymous.
SY	source asserted synonymy.

Parent (PAR)	has parent relationship in a Metathesaurus source vocabulary.
Child (CHD)	has child relationship in a Metathesaurus source vocabulary.
Sibling (SIB)	has sibling relationship in a Metathesaurus source vocabulary.
AQ	is an allowed qualifier for a concept in a Metathesaurus source vocabulary.
QB	can be qualified by a concept in a Metathesaurus source vocabulary.

2.3.2 CONTEXTS IN THE METATHESAURUS

Starting with the 2002AA release, sources with contexts now have "Full" contexts, i.e., all levels of terms may have Ancestors, Parents, Children and Siblings. Title and mini contexts have been eliminated. A Full context may also be further designated to be one of Multiple, Nosib (No siblings) or both Multiple and Nosib.

"Multiple" indicates that a single concept in this source may have multiple hierarchical positions.

No siblings (Nosib) indicates that siblings have not been computed for this source.

Listing of sources with contexts (by root source abbreviation):

AIR	FULL-NOSIB-MULTIPLE
ALT	FULL
AOD	FULL
CCS	FULL
CPM	FULL-MULTIPLE
CPT	FULL-NOSIB
CSP	FULL-MULTIPLE
CST	FULL-MULTIPLE
DSM3R	FULL-NOSIB
DSM4	FULL-NOSIB
HCPCS	FULL-NOSIB
HHC	FULL
HL7	FULL-MULTIPLE
ICD10AM	FULL
ICD10	FULL-NOSIB
ICD9CM	FULL
ICPC2E	FULL-NOSIB-MULTIPLE
ICPC2P	FULL-NOSIB-MULTIPLE
ICPC	FULL-NOSIB-MULTIPLE
MDR	FULL-MULTIPLE
MSH	FULL-MULTIPLE
NAN	FULL

NCBI	FULL-NOSIB
NCI	FULL-MULTIPLE
NEU	FULL
NIC	FULL-NOSIB-MULTIPLE
NOC	FULL
OMS	FULL-MULTIPLE
PCDS	FULL
PDQ	FULL-NOSIB-MULTIPLE
PPAC	FULL
PSY	FULL-NOSIB-MULTIPLE
RCD	FULL-MULTIPLE
SNM	FULL-NOSIB-MULTIPLE
SNMI	FULL-NOSIB
UMD	FULL-MULTIPLE
UWDA	FULL-MULTIPLE
VANDF	FULL-NOSIB-MULTIPLE
WHO	FULL-MULTIPLE

2.4 CONCEPT AND STRING ATTRIBUTES

All other pieces of information in the Metathesaurus are either attributes of a concept or attributes of a string. For example, the semantic types "Pathologic Function" and "Finding" and the definition "Disorder of cardiac rhythm characterized by rapid, irregular atrial impulses and ineffective atrial contractions." are attributes of the concept with the preferred name "Atrial Fibrillation". The various sources of the string "Atrial Fibrillation" e.g., SNM|PT|F73570, ICD9CM|PT|427.31, are string attributes.

The structure of the Metathesaurus distribution files facilitates access to concept relationships and to string and concept attributes, irrespective of the string used as a point of entry to a concept.

2.5 DATA ELEMENTS

2.5.0 INTRODUCTION

The Metathesaurus is built to be concept oriented; and there is one key identifier, the Concept Unique Identifier or [CUI](#), which is used to link all information about a concept. CUIs connect all names for a concept, are used to link concepts in relationships, and identify all attributes of a concept.

There are also Lexical Unique Identifiers ([LUIs](#)) which identify and link all concept names which are lexical variants of each other; and String Unique Identifiers ([SUIs](#)) which identify and link all identical strings.

The Metathesaurus has four logical groups of data elements, which are briefly described in the following sections. A complete description of the data elements that make up the Metathesaurus files appears in [Appendix B, Sections B.1.1 \(Column Descriptions\)](#) and [B.1.2 \(Attribute Descriptions\)](#).

2.5.1 CONCEPT NAMES

In addition to the Unique Identifiers discussed above, other columns specify certain characteristics of each concept. The concept name columns are as follows:

CUI	Unique Identifier for Concept
LAT	Language of Term
LRL	Least Restriction Level
LUI	Unique Identifier for Term
STR	String
STT	String Type
SUI	Unique Identifier for String
TS	Term Status

See [Section B.1.1](#) for descriptions of each column and the file MRCON.

2.5.2 RELATIONSHIPS

These data elements describe relationships between different Metathesaurus concepts or meanings. By definition, these are non-synonymous relationships, although the combination of concepts represented in an Associated Expression may have a meaning equivalent to the single concept to which the expression is linked.

Relationships may be derived from the Metathesaurus source vocabularies or be added expressly for the Metathesaurus. The relationship data elements are as follows:

ATX	Associated Expressions
COC	Co-occurring Concepts
REL	Related Concepts

See [Section B.1.1](#) for descriptions of these columns and the files MRREL, MRCOC and MRATX.

2.5.3 ATTRIBUTES

These data elements provide additional information that helps to define the meaning of a concept and explain how it has been used in various information sources; identify special kinds of terms; or provide information about the source(s) of the unique strings in the Metathesaurus. There are more than 110 attributes in the Metathesaurus. A few examples are listed below. [See Appendix B, Section B.1.2](#) for a complete list.

Concept Attributes

DEF	Definition
RN	Registry Number
STY	Semantic Type

See [Section B.1.2](#) for descriptions of all the attributes and the file MRSAT.

2.5.4 VOCABULARY SOURCE INFORMATION AND CONTEXTS

Each occurrence of a string (name) in a source is identified by:

SAB	Source abbreviation
CODE	Code or identifier in source vocabulary
TTY	Term Type

See MRSO and MRSAB file for more information.

Starting with 2002AD, the UMLS Metathesaurus has "versionless" or "root" Source Abbreviations ([RSABs](#)) in the MR files. In each case, there is a link in a new file called MRSAB from the "root" SAB to fully specified version information for the current release. MetamorphoSys can produce files with either the root or versioned SABs so that either form can be utilized by a user.

For example, the released SAB for MeSH is now simply "MSH". In MRSAB, you will find the current versioned SAB is MSH2003_2002_10_24.

The major advantage of this change is that all MR file rows which represent information which has not changed between versions will also be unchanged, making an update model, using row updates, much simpler and smaller.

Revised Concept Structure for Source Concepts (SRC):

In conjunction with the change to releasing versionless SABs and MRSAB, we have overhauled the "SRC" or "Metathesaurus Source Terminology Names" source. Each SAB will now have two or more related concepts with distinct meanings: one versionless or "root" concept and at least one versioned concept. We have introduced new term types to further distinguish these concepts:

SSN	source short name, used in the UMLS Knowledge Sources Server
RPT	root preferred term
RHT	root hierarchical term
RAB	root abbreviation
RSY	root synonym
VPT	versioned preferred term
VAB	versioned abbreviation
VSY	versioned synonym

For example, the root MeSH concept contains the following SRC names:

STR	SAB	TTY	CODE
MSH	SRC	RAB	V-MSH
Medical Subject Headings	SRC	RPT	V-MSH
MeSH	SRC	RHT	V-MSH
MeSH	SRC	SSN	V-MSH

The versioned MeSH concept looks like this:

STR	SAB	TTY	CODE
Medical Subject Headings, 2002_08_14	SRC	VPT	V-MSH2003_2002_08_14
MSH2003_2002_08_14	SRC	VAB	V-MSH2003_2002_08_14

The hierarchy treetop will always be the root concept. There will always be a `has_version/version_of` relationship between the root and versioned concepts. There may also be `"has_translation/translation_of"` relationships between the root concepts for English-language sources and their non-English translations.

The hierarchies in each source are represented in the MRCXT file; distance-one hierarchical relationships are also found in the MRREL file. See MRCXT and MRREL files.

2.6 CONCEPT NAME INDEXES

2.6.0 INTRODUCTION

To assist system developers in building applications that retrieve all strings or concept names which include specific words or groups of words, three indexes to the concept names are provided: a Word Index, a Normalized Word Index (for English words only), and a Normalized String Index (for English strings only). The indexes are described in sections [2.6.1](#), [2.6.2](#), and [2.6.3](#) respectively. To make the distinctions among them clearer, the examples include words or strings that would appear in each index for the following set of Metathesaurus concept names:

Lung Diseases, Obstructive	(C0024117, L0024117, S0058463)
Obstructive Lung Diseases	(C0024117, L0024117, S0068169)
Lung Disease, Obstructive	(C0024117, L0024117, S0058458)
Obstructive Lung Disease	(C0024117, L0024117, S0068168)

2.6.1 WORD INDEX

2.6.1.1 Description

The word index connects each individual word in any Metathesaurus string to all its related string, term, and concept identifiers. There are separate word index files for each language in the Metathesaurus.

There is one entry for each word found in each unique string in each language. Each entry has five subelements.

1. [LAT](#)
2. [WD](#)
3. [CUI](#)
4. [LUI](#)
5. [SUI](#)

2.6.1.2 Definition of a Word

For the purpose of creating this index, a word is defined as a token containing only alphanumeric characters with length one or greater; for more information, see the SPECIALIST Lexicon and tools.

2.6.1.3 Word Index Example

For the four concept names listed in Section 2.6.0, the word index will contain multiple entries for each of the following words: disease, diseases, lung, obstructive. Two of the entries generated for the names "Lung Disease, Obstructive" and "Obstructive Lung Disease" are shown below:

```
ENG|disease|C0024117|L0024117|S0058458|
```

```
ENG|disease|C0024117|L0024117|S0068168|
```

2.6.2 NORMALIZED WORD INDEX

2.6.2.1 Description

The normalized word index connects each individual normalized English word to all its related string, term, and concept identifiers.

There is one entry for each normalized word found in each unique English string. There are no entries for other languages in this index. Each entry has five subelements.

1. [LAT](#) (always ENG in this edition of the Metathesaurus)
2. [WD](#)
3. [CUI](#)
4. [LUI](#)
5. [SUI](#)

2.6.2.2 Definition of Normalized Word

The normalization process involves breaking a string into its constituent words, lowercasing each word and converting it to its uninflected form. Normalized words are generated by uninflecting each word and stripping out a small number of stop words. The uninflected forms are generated using the SPECIALIST lexicon if the words appear in the lexicon; otherwise they are generated algorithmically.

2.6.2.3 Normalized Word Example

For the four concept names listed in Section 2.6.0 the normalized word index will contain multiple entries for each of the following words: disease, lung, obstructive. Since the normalized word index contains base forms only, it does not contain entries for the plural "diseases". In this index, therefore, all four concept names are linked to the normalized word "disease", as follows:

ENG|disease|C0024117|L0024117|S0058458|

ENG|disease|C0024117|L0024117|S0058463|

ENG|disease|C0024117|L0024117|S0068168|

ENG|disease|C0024117|L0024117|S0068169|

2.6.3 NORMALIZED STRING INDEX

2.6.3.1 Description

The normalized string index connects the normalized form of a Metathesaurus string to all its related string, term, and concept identifiers. There is one entry for each unique (non-normalized) English string. There are no entries for other languages in this index. Each entry has five subelements.

1. [LAT](#) (always ENG in this edition of the Metathesaurus)
2. [NSTR](#)
3. [CUI](#)
4. [LUI](#)
5. [SUI](#)

2.6.3.2 Definition of Normalized String

The normalization process involves breaking a string into its constituent words, lowercasing each word, converting each word to its uninflected form, and sorting the words in alphabetic order. Normalized strings are generated by uninflecting each word leaving out a small number of stop words. The uninflected forms are generated using the SPECIALIST lexicon if the words appear in the lexicon; otherwise they are generated algorithmically.

2.6.3.3 Normalized String Example

Since the four concept names listed in Section 2.6.0 are composed of the same set of normalized words, the Normalized String Index will contain four entries for a single string: disease lung obstructive, in which the component normalized words appear in alphabetical order. The complete set of Normalized String Index entries generated by the four concept names is as follows:

ENG|disease lung obstructive|C0024117|L0024117|S0058458|

ENG|disease lung obstructive|C0024117|L0024117|S0058463|

ENG|disease lung obstructive|C0024117|L0024115|S0068168|

ENG|disease lung obstructive|C0024117|L0024117|S0068169|

2.6.4 WORD INDEX PROGRAMS

The programs that generate these indexes are written in Java. They may be of use to system developers who are developing their own interfaces to the UMLS data or for other purposes. [Section 4](#) includes information about these and other lexical programs provided with the UMLS Knowledge Sources.

2.7 FILE FORMAT

2.7.0 INTRODUCTION

The Metathesaurus data is distributed in an ASCII Relational Format.

2.7.1 ASCII RELATIONAL FORMAT

2.7.1.1 General Description

The Metathesaurus relational format is not fully normalized. By design, there is duplication of data among different relations and within certain relations. In particular, links between different Metathesaurus concepts appear twice (e.g., from entry A to entry B and from entry B to entry A). Developers will need to make their own decisions about the extent to which this redundancy should be retained, reduced, or increased for their specific applications.

All file names in the relational format begin with the letters MR.

All files except MRRANK are sorted by row.

2.7.1.1.1 Data Files

The data in each Metathesaurus entry may be represented in more than 20 different "relations" or files. These files correspond to the four logical groups of data elements described in Section 2.5 and the indexes described in Section 2.6 as follows:

Metathesaurus Concept Names [\(2.5.1\)](#) = MRCON

Relationships between Different Concept Names [\(2.5.2\)](#) = MRREL, MRCOC, MRATX

Attributes [\(2.5.3\)](#) = MRSAT, MRDEF, MRSTY, MRLO, MRRANK

Source Information and contexts [\(2.5.4\)](#) = MRSO, MRCXT, MRSAB

Indexes [\(2.6\)](#) = MRXW.BAQ, MRXW.DAN, MRXW.DUT, MRXW.ENG, MRXW.FIN, MRXW.FRE, MRXW.GER, MRXW.HEB, MRXW.HUN, MRXW.ITA, MRXW.NOR, MRXW.POR, MRXW.RUS, MRXW.SPA, MRXW.SWE, MRXNW.ENG, MRXNS.ENG

2.7.1.1.2 Ancillary Files

There are 5 ancillary files:

[MRFILES](#) describes the size of the data files.

MRCOLS	describes the columns or data elements in the data files.
AMBIG.LUI	contains all "Ambiguous" term identifiers in the Metathesaurus.
AMBIG.SUI	contains all "Ambiguous" string identifiers in the Metathesaurus.
MRCUI	contains all retired CUIs, with mappings where possible.

The AMBIG* files provide a convenient way to identify all Metathesaurus terms and strings that have more than one meaning in Metathesaurus source vocabularies.

2.7.1.1.3 Columns and Rows

Each relation or named table of data values has by definition a fixed number of columns; the number of rows depends on the content of a particular version of the Metathesaurus.

A column is a sequence of all the values in a given data element or logical subelement. In general, columns for longer variable length data elements will appear to the right of columns for shorter and/or fixed length data elements. The information for all columns in the relational files is described in [Appendix B.1.1](#), Metathesaurus Column Descriptions.

A row contains the values for one or more data elements or logical subelements for one Metathesaurus entry. Depending on the nature of the data elements involved, each Metathesaurus entry may have one or more rows in a given file. The values for the different data elements or logical subelements represented in the row are separated by vertical bars (|). If an optional element is blank, the vertical bars are still used to maintain the correct positioning of the subsequent elements. Each row is terminated by a vertical bar and line termination.

2.7.1.2 Descriptions of Each File

2.7.1.2.1 Relation Relation (File = MRFILES)

There is exactly one row in this file for each physical segment of the files in the relational format. The columns or data elements in the file are:

Col.	Description
FIL	Physical FILENAME
DES	Descriptive Name
FMT	Comma separated list of COL, in order
CLS	# of COLUMNS
RWS	# of ROWS
BTS	Size in bytes in this format (ISO/PC or Unix)

Sample Records

MRATX|Associated Expressions|CUI,SAB,REL,ATX|4|7295|442571|
 MRCOC|Co-occurring Concepts|CUI1,CUI2,SAB,COT,COF,COA|6|9061980|343331578|
 MRCOLS|Attribute Relation|COL,DES,REF,MIN,AV,MAX,FIL, DTY|8|115|5728|

2.7.1.2.2 Attribute Relation (File = MRCOLS)

There is exactly one row in this file for each column or data element in each file in the relational format.

Col.	Description
COL	Column or data element name
DES	Descriptive Name
REF	Documentation Section Number
MIN	Minimum Length, Characters
AV	Average Length
MAX	Maximum Length, Characters
FIL	Physical FILENAME in which this field occurs
DTY	SQL-92 data type for this column

Sample Records

ATN|Attribute name||2|3.15|7|MRSAT|varchar(20)|
 ATV|Attribute value||1|9.71|3634|MRSAT|varchar(4000)|
 ATX|Associated expression||5|35.89|242|MRATX|varchar(300)|

2.7.1.2.3 Concept Names (File = MRCON)

There is exactly one row in this file for each meaning of each unique string in the Metathesaurus, i.e., there is exactly one row for each unique CUI-SUI combination in the Metathesaurus. Any difference in upper-lower case, word order, etc. creates a different unique string.

Col.	Description
CUI	Unique identifier for concept
LAT	Language of Term

TS	Term status
LUI	Unique identifier for term
STT	String type
SUI	Unique identifier for string
STR	String
LRL	Least Restriction Level

Sample Records

```
C0002871|ENG|P|L0002871|PF|S0013742|Anemia|0|
C0002871|ENG|P|L0002871|VP|S0013787|Anemias|0|
C0002871|ENG|P|L0002871|VC|S0352787|ANEMIA|0|
C0002871|ENG|P|L0002871|VC|S0414880|anemia|0|
C0002871|ENG|P|L0002871|VO|S0470197|Anemia, NOS|3|
C0002871|ENG|S|L0280031|PF|S0803242|Anaemia|3|
```

2.7.1.2.4 Related Concepts (File = MRREL)

There is one row in this table for each relationship between Metathesaurus concepts known to the Metathesaurus, with the following exceptions found in other files: co-occurrences found in MRCOC; Locator information in MRLO; and Associated Expressions found in MRATX.

Note that for asymmetrical relationships there is one row for each direction of the relationship. Note also the direction of REL - the relationship which the SECOND concept (with Concept Unique Identifier CUI2) HAS TO the FIRST concept (with Concept Unique Identifier CUI1).

Col.	Description
CUI1	Unique identifier of first concept
REL	Relationship of second to first concept
CUI2	Unique identifier of second concept
RELA	Relationship attribute
SAB	Abbreviation of the source of relationship
SL	Source of relationship labels

[MG](#) Machine-generated and unverified indicator (optional)

Sample Records

```
C0002871|CHD|C0002891|isa|MSH|MSH||
  Anemia, Neonatal (C0002891)
  has CHILD REL and isa RELA
  to Anemia (C0002871)

C0002871|RB|C0221016||MTH|MTH||
  Red blood cell disorder, NOS (C0221016)
  has broader REL
  to Anemia (C0002871)

C0002871|RL|C0002886|mapped_to|SNMI|SNMI||
  Anemia, Macrocytic (C0002886)
  has like relationship
  to Anemia (C0002871)

C0002871|RO|C0002886|clinically_associated_with|CCPSS|CCPSS||
  Megaloblastic anemia due to folate deficiency, NOS (C0151482)
  has clinically_associated_with relationship
  to Anemia (C0002871)
```

2.7.1.2.5 Co-occurring Concepts (File = MRCOC)

There are two rows in this table for each pair of concepts that co-occur in each information source represented one for each direction of the relationship. (Note that the [COA](#) data may be different for each direction of the relationship). Many Metathesaurus concepts have no entries in this file. Due to the very large number of co-occurrence relationships, they are distributed in a separate file.

Col.	Description
CUI1	Unique identifier of first concept
CUI2	Unique identifier of second concept Note: Where COT is MeSH topical qualifier (LQ) and CUI2 is not present, the count of citations of CUI1 with no MeSH qualifiers is reported.
SOC	Abbreviation of the Source of co-occurrence information if applicable
COT	Type of co-occurrence
COF	Frequency of co-occurrence, if applicable
COA	Attributes of co-occurrence, if applicable

Sample Records

```
C0002871||MED|LQ|1||
```

C0002871|C0000530|MBD|L|2|CI=1,EN=1,ME=1,PA=1|

C0002871|C0000727|MBD|L|1|BL=1,ET=1|

C0002871|C0000737|MBD|L|1|ET=1|

C0002871|C0000772|MBD|L|2|CN=2|

Illustrative Examples (may not be current):

C0000039|C0001977|MBD|L|5|CH=2,<>=1,AN=1,ME=1|

has frequency of five, two with CH subheading and one each for no subheading, AN, and ME. This means four co-occurring citations had subheadings (one had none) and since there are four subheading counts (2+1+1), these four had one SH each. But:

C0000039|C0023828|MBD|L|31|CH=24,<>=5,ME=4,PD=2,PK=1,RE=1|

has frequency of 31, with 37 "Attribute" counts; five citations have no SH, while 26 have a total of 32 SHs - some citations had more than one SH.

In this example there is no CUI2:

C0005851||MBD|LQ|6||

because there are 6 cases in MBD of citations with no MeSH qualifier

And finally, in this example, the co-occurrence is a positive one in a Knowledge Base, AI Rheum:

C0015967|C0026691|AIR|KP|||

Co-occurrences are concepts that occur together in the same "entries" in some information source. The relationships represented here are obtained from machine-manipulation of the information source. Co-occurrence relationships may exist between similar concepts (e.g., "Atrial Fibrillation" and "Arrhythmia") or between very different concepts that nevertheless have some important connection in the field of biomedicine (e.g., "Atrial Fibrillation" and "Digoxin"), or between a primary concept and a qualifier e.g., "Lithotripsy" and "instrumentation". A co-occurrence relationship can exist between two concepts that have no other apparent relationship, although the frequency of such co-occurrences will be small.

In the current Metathesaurus, there are three sources of co-occurrence data: MEDLINE, AI/RHEUM, and CCPSS. From MEDLINE, co-occurrence data was computed for concepts that were designated as principal or main points in the same journal article i.e., the co-occurrence counts do not include articles in which either or both of the concepts were present and indexed in MEDLINE but not designated as main points. (A concept is considered to be a main point if the * is attached to the main heading or any of its subheadings.)

Two overall frequencies of MEDLINE co-occurrence are provided: one for recent MEDLINE data (MED) and one for MEDLINE data from a preceding block of years (MBD); see [SOC](#) for date ranges in the current edition. Separate counts are provided for the frequencies with which the first concept was qualified by different MeSH qualifiers or by no qualifier at all when it co-occurred with the second concept. There are separate entries for each direction of the co-occurrence relationship. The related subheading occurrence information in each entry belongs to the first concept in the entry and is therefore different for each direction of the relationship.

In addition to the specific qualifier information associated with two co-occurring concepts, this element also includes in entries with LQ and LQB values for type of co-occurrence, totals for the number of times each main concept was qualified by a specific subheading or by no subheading.

The AI/RHEUM co-occurrence data represent the co-occurrence of diseases and findings in the AI/RHEUM knowledge base, i.e., the diseases that co-occur with a particular finding and the findings that co-occur with a particular disease. Each disease/finding pair can co-occur only once in the AI/RHEUM knowledge base.

In CCPSS, the co-occurrence data is extracted from patient records and includes problem-problem co-occurrences within a patient record as well as problem-modifier co-occurrences.

2.7.1.2.6 Simple Concept, Term, and String Attributes (File = MRSAT)

There is exactly one row in this table for each concept, term and string attribute that does not have a sub-element structure. All Metathesaurus concepts have entries in this file.

Col.	Description
CUI	Unique identifier for concept
LUI	Unique identifier for term (optional)
SUI	Unique identifier for string (optional)
CODE	Unique identifier or code for entry in the source of the attribute, e.g., for all attributes derived from MeSH, the MeSH unique identifier (optional).
ATN	Attribute name. Possible values are all described in Appendix B, Section B.1.2 .
SAB	Abbreviation of the source of the attribute. Allowed values are listed in Appendix B, Section B.2 .)
ATV	Attribute value described under specific attribute name in Appendix B, Section B.1.2 . A few attribute values exceed 1,000 characters.

Sample Records

```
C0002871|L0002871|S0013742|D000740|MMR|MSH|19960610|
C0002871|L0002871|S0013742|D000740|MN|MSH|C15.378.71|
C0002871|L0002871|S0013742|D000740|TH|MSH|POPLINE (1994)|
C0002871|L0002871|S0414880|208/04453|SOS|PDQ|secondary related condition|
C0002871|L0002871|S0470197|DC-10010|SIC|SNMI|285.9|
```

2.7.1.2.7 Definitions (File = MRDEF)

There is exactly one row in this file for each definition in the Metathesaurus. A few definitions approach 3,000 characters in length.

Col.	Description
CUI	Unique identifier for concept
SAB	Abbreviation of the source of the definition
DEF	Definition

Sample Records

C0002871|MSH|A reduction in the number of circulating erythrocytes or in the quantity of hemoglobin.|

2.7.1.2.8 Sources (File = MRSO)

The vocabulary source(s) for a concept, term, and string.

There is exactly one row in this file for each source of each string in the Metathesaurus. All Metathesaurus concepts have entries in this file.

Col.	Description
CUI	Unique identifier for concept
LUI	Unique identifier for term
SUI	Unique identifier for string
SAB	Source abbreviation. Allowed values are listed in Appendix B, Section B.2
TTY	Term type in that source. Allowed values are listed in Appendix B., Section B.4.
CODE	Unique Identifier or code for string in that source.
SRL	Source Restriction Level

Sample Records

C0002871|L0002871|S0013742|CCS|MD|4.1|0|
 C0002871|L0002871|S0013742|ICPCPAE|PT|B82005|3|
 C0002871|L0002871|S0013742|LCH|PT|U000235|0|
 C0002871|L0002871|S0013742|MSH|MH|D000740|0|
 C0002871|L0002871|S0013742|MTH|PT|U000161|0|
 C0002871|L0002871|S0013742|MTH|PT|U000164|0|
 C0002871|L0002871|S0013742|PSY|PT|02450|3|
 C0002871|L0002871|S0013742|RCDAE|PT|XM05A|3|

The information in MRSO can be used to determine whether a particular concept, name, or code is present in a particular source, and in what form it appears. This information can be used to extract from the Metathesaurus the terms appropriate for searching information sources that have been indexed by specific vocabularies or classifications. In the case of the COSTART vocabulary, the CODE Unique Identifier is actually an official abbreviation composed of alphabetic characters which in some cases may include a space.

NLM recommends that MetamorphoSys (described in [Section 2.8](#)) be used to exclude vocabularies because it reliably removes ALL source information.

2.7.1.2.9 Semantic Types (File = MRSTY)

There is exactly one row in this file for each semantic type assigned to each concept. All Metathesaurus concepts have at least one

entry in this file. Many have more than one entry.

Col.	Description
CUI	Unique identifier of concept
TUI	Unique identifier of Semantic type
STY	Semantic type. The valid values are defined in the Semantic Network.

Sample Record

C0002871|T047|Disease or Syndrome|

2.7.1.2.10 Concept contexts (File = MRCXT)

There are rows in this file for each occurrence of a concept in a hierarchy in any of the UMLS source vocabularies - a "context" in this discussion. Many Metathesaurus concepts have multiple contexts while others may have none. The number of rows per context differs depending on the number of ancestor, sibling, or child terms the concept has in that context. Because some concepts have multiple contexts in the same source (e.g., MeSH), a context number (CXN - e.g., 1, 2, 3) is used to identify all members of the same context. The CXNs are not global but are created as required for each concept. Since some concepts have multiple contexts in the same vocabulary with the same SUI, each distinct context can be retrieved with a CUI-SUI-SAB-CXN key. The "distance-1 relationships," i.e., the immediate parent, immediate child, and sibling relationships, represented in this file are also present in the MRREL file.

(Note: The RELA was incorrectly called REL in versions before 2001.)

Col.	Description
CUI	Unique identifier of concept
SUI	Unique identifier for string used in this context
SAB	Source abbreviation. Allowed values are listed in Appendix B, Section B.2
CODE	Unique Identifier or code for string in that source.
CXN	The context number (to distinguish multiple contexts in the same source with the same SUI).
CXL	Context member label, i.e., ANC for ancestor of this concept, CCP for concept, SIB for sibling of this concept, CHD for child of this concept.
RNK	For rows with a CXL value of ANC, the rank of the ancestors (e.g., a value of 1 denotes the most remote ancestor in the hierarchy)
CXS	String for context member.

CUI2	Unique concept identifier of context member (may be empty if context member is not yet in the Metathesaurus).
HCD	Hierarchical number or code of context member in this source (optional).
RELA	Relationship attribute providing further categorization of the CXL, if applicable and known. Valid values are the Semantic Network Relationships (see the UMLS Semantic Network documentation in Section 3 and the SRDEF file).
XC	A plus(+) sign indicates that the CUI2 for this row has children in this context. If this field is empty, the CUI2 does not have children in this context.

Sample Records

```

C0002871|S0013742|MSH|D000740|1|ANC|1|MeSH|C0220876|||
C0002871|S0013742|MSH|D000740|1|ANC|2|Diseases (MeSH Category)|C0012674|C||
C0002871|S0013742|MSH|D000740|1|ANC|3|Hemic and Lymphatic Diseases|C0018981|C15||
C0002871|S0013742|MSH|D000740|1|ANC|4|Hematologic Diseases|C0018939|C15.378|isa|
C0002871|S0013742|MSH|D000740|1|CCP||Anemia|C0002871|C15.378.71|isa|+
C0002871|S0013742|MSH|D000740|1|CHD||Anemia, Aplastic|C0002874|C15.378.71.85|isa|+
C0002871|S0013742|MSH|D000740|1|SIB||Blood Protein Disorders|C0005830|C15.378.147|isa|+
C0002871|S0013742|MSH|D000740|1|CHD||Anemia, Hemolytic|C0002878|C15.378.71.141|isa|+

```

2.7.1.2.11 Associated Expressions (File = MRATX)

There is one row in this table for each vocabulary expression (i.e., combination of terms from a specific Metathesaurus source vocabulary) identified as having a relationship to a concept in the Metathesaurus. The majority of Metathesaurus entries have no entries in this table.

Col.	Description
CUI	Unique identifier of concept to which the expression is related
SAB	Abbreviation of source of terms in expression. Allowed values are listed in Appendix B, Section B.1)
REL	Relationship of meaning of expression to main concept
ATX	Associated expression

Sample Records

```

C0001207|MSH|S|<Acromegaly> AND <Gigantism>|
C0001296|LCH|U|<Insurance>/<Statistics>|
C0001355|MSH|S|<Kidney Failure, Acute> AND <Kidney Papillary Necrosis>|

```

2.7.1.2.12 Locators (File = MRLO)

Selected information sources in which the Metathesaurus concept was detected.

Notes:

NLM is reviewing these references to external sources of information and would appreciate feedback from users about the utility or suggested changes to this file.

HSTAT was removed from this file in 2001, since current information is better obtained and searched at:

<http://hstat.nlm.nih.gov>

There is one row in this table for each Metathesaurus concept identified as appearing in each of a selected set of a machine-readable information sources. If the same concept is identified as appearing in more than one of these information sources (e.g., MEDLINE, DXPLAIN, QMR), it will have multiple rows in this table.

These columns are described in the appendix:

Col.	Description
CUI	Unique identifier of concept
ISN	Name of information source or database in which concept appears
FR	Frequency count of number of occurrences of concept in the information source (optional)
UN	Meaning of frequency (optional)
SUI	Unique identifier of string if name used in information source appears in MRCON (optional)
SNA	Actual name that occurs in the information source if not otherwise present in the Metathesaurus (optional)
SQUI	Unique identifier of record in which the concept appears in source (optional)

Sample Records

```
C0002871|DXP||S0352787||
C0002871|MBD|2361|*CITATIONS|S0013742||
C0002871|MED|898|*CITATIONS|S0013742||
C0002871|PDQ||S0414880||
C0002871|QMR||S0013787||
C0002872|QMR|||Anemias|
```

The Metathesaurus does not contain all concepts appearing in some of these information sources, and some Metathesaurus concepts present in these sources may not be flagged as such if the concept is represented in the information source by a term or concept name not present in the Metathesaurus. In some cases the source name is followed by: the frequency of occurrence in that source, the precise meaning of the frequency data, (e.g., whether it refers to a number of citations, etc.). Information in this element can be used to determine which of a limited repertoire of sources contain detected information closely related to the concept. System developers are encouraged to add data for local information sources to this element to support local applications. Data for additional nationally available sources may be included in subsequent versions of the Metathesaurus.

For MEDLINE segments only, if the frequency subelement is blank, the term did not appear as a principal point in any MEDLINE citations for that segment.

2.7.1.2.13 Concept Name Ranking (File=MRRANK)

There is exactly one row for each concept name type from each Metathesaurus source vocabulary (each SAB-TTY combination). The RANK and SUPRES values in the distributed file are those used in Metathesaurus production. Users are free to change these values to suit their needs and preferences, then change the naming precedence and suppressibility (TS in MRCON) by using MetamorphoSys to create a customized Metathesaurus.

Col.	Description
RANK	Numeric order of precedence, higher value wins
SAB	Abbreviation for source vocabulary
TTY	Abbreviation for concept name type in source vocabulary
SUPRES	Flag indicating that this SAB and TTY will create a TS=s MRCON entry; see TS

Sample Records

```
0210|AIR|SY|N|
0209|ULT|PT|N|
0208|CPT|PT|N|
```

2.7.1.2.14 Word Index (File = MRXW.BAQ, MRXW.DAN, MRXW.DUT, MRXW.ENG, MRXW.FIN, MRXW.FRE, MRXW.GER, MRXW.HEB, MRXW.HUN, MRXW.ITA, MRXW.NOR, MRXW.POR, MRXW.RUS, MRXW.SPA, MRXW.SWE)

There is one row in these tables for each word found in each unique Metathesaurus string (ignoring upper-lower case). All Metathesaurus entries have entries in the word index. The entries are sorted in ASCII order.

Col.	Description
LAT	Abbreviation of language of the string in which the word appears
WD	Word in lowercase
CUI	Concept identifier
LUI	Term identifier
SUI	String identifier

Sample Records from MRXW.ENG

ENG|anaemia|C0002871|L0280031|S0352688|
 ENG|anemia|C0002871|L0002871|S0013742|
 ENG|anemias|C0002871|L0002871|S0013787|
 ENG|blood|C0002871|L0376533|S0500659|
 ENG|cells|C0002871|L0376533|S0500659|

Sample Records from MRXW.FRE

FRE|ANEMIE|C0002871|L0162748|S0227229|

2.7.1.2.15 Normalized Word Index (File=MRXNW.ENG)

There is one row in this table for each normalized word found in each unique English-language Metathesaurus string. All English-language Metathesaurus entries have entries in the normalized word index. There are no normalized string indexes for other languages in this edition of the Metathesaurus.

Col.	Description
LAT	Abbreviation of language of the string in which the word appears (always ENG in this edition of the Metathesaurus)
NWD	Normalized word in lowercase (described in Section 2.6.2.1)
CUI	Concept identifier
LUI	Term identifier
SUI	String identifier

Sample Records

ENG|anaemia|C0002871|L0280031|S0352688|
 ENG|anemia|C0002871|L0002871|S0013742|
 ENG|anemia|C0002871|L0002871|S0013787|
 ENG|blood|C0002871|L0376533|S0500659|
 ENG|cell|C0002871|L0376533|S0500659|

2.7.1.2.16 Normalized String Index (File=MRXNS.ENG)

There is one row in this table for each normalized string found in each unique English-language Metathesaurus string (ignoring upper-lower case). All English-language Metathesaurus entries have entries in the normalized string index. There are no normalized word indexes for other languages in this edition of the Metathesaurus.

Col.	Description
LAT	Abbreviation of language of the string (always ENG in this edition of the Metathesaurus)

NSTR	Normalized string in lowercase (described in Section 2.6.3.1)
CUI	Concept identifier
LUI	Term identifier
SUI	String identifier

Sample Records

```
ENG|anaemia|C0002871|L0280031|S0352688|
ENG|anaemia unspecified|C0002871|L0696700|S0803315|
ENG|anemia|C0002871|L0002871|S0013787|
```

2.7.1.2.17 Ambiguous Term Identifiers (File = AMBIG.LUI)

There is exactly one row in this table for each Lexical Unique Identifier (LUI) that is linked to multiple Concept Unique Identifiers (CUIs); i.e., it identifies those lexical variant classes which have multiple meanings in the Metathesaurus.

In the Metathesaurus, the LUI links all strings within the English language that are identified as lexical variants of each other by the luinorm program found in the UMLS SPECIALIST Lexicon and Tools (see [sections 4](#) and [4.8](#) in this manual). LUIs are assigned irrespective of the meaning of each string. This table may be useful to system developers who wish to make use of the lexical programs in their applications.

Col.	Description
LUI	Lexical Unique Identifier
CUIs	List of Concept Unique Identifiers to which the LUI is linked, separated by commas, e.g., C#####,C#####

2.7.1.2.18 Ambiguous String Identifiers (File=AMBIG.SUI)

There is exactly one row in this file for each string identifier ([SUI](#)) that is linked to multiple concept identifiers ([CUI](#)). This file is now in the META directory (use to be in CHANGE directory). In the Metathesaurus, there is only one SUI for each unique string within each language, even if the string has multiple meanings. This table is only of interest to system developers who make use of the SUI in their applications or in local data files.

Col.	Description
SUI	String Unique Identifier
CUIs	List of Concept Unique Identifiers to which the SUI is linked, separated by commas, e.g., C#####,C#####

2.7.1.2.19 Metathesaurus Change Files

2.7.1.2.19.1 Introduction

There are six files or relations that identify key differences between entries in the previous and the current edition of the Metathesaurus. They are in the subdirectory called CHANGE in META directory and are also accessible on the UMLS [Knowledge Source Server](#). Developers can use these special files to determine whether there have been changes that affect their applications.

The usefulness of individual files will depend on how data from the Metathesaurus have been linked or incorporated in a particular application.

2.7.1.2.19.2 General Description of the Files

Each relation or named table of data has a fixed number of columns and variable number of rows. A column is a sequence of all the values in a given data element. A row contains the values for two or more data elements for one entry. The values for the different data elements in the row are separated by vertical bars (|). Each row ends with a vertical bar and line termination.

2.7.1.2.19.3 Deleted Concepts (File=DELETED.CUI)

There is exactly one row in this table for each reviewed concept that was present in the previous Metathesaurus and is not present in the 2003AA Metathesaurus.

Cols.

CUI Concept Unique Identifier in the previous Metathesaurus

STR Preferred name of this concept in the previous Metathesaurus

2.7.1.2.19.4 Merged Concepts (File=MERGED.CUI)

There is exactly one row in this table for each released concept in the previous Metathesaurus (CUI1) that was merged into another released concept from the previous Metathesaurus (CUI2). When this merge occurs, the first CUI (CUI1) was retired; this table shows the CUI (CUI2) for the merged concept in this Metathesaurus.

Entries in this file represent concepts pairs that were considered to have different meanings in the previous edition, but which are now identified as synonyms

Cols.

CUI1 Concept Unique Identifier in the previous Metathesaurus

CUI2 Concept Unique Identifier in this Metathesaurus in format C#####

2.7.1.2.19.5 Deleted Terms (File=DELETED.LUI)

There is exactly one row in this table for each Lexical Unique Identifier (LUI) that appeared in the previous Metathesaurus, but does not appear in this Metathesaurus.

Metathesaurus Lexical Unique Identifiers (LUIs) are assigned by the luinorm program, part of LVG program in the UMLS SPECIALIST Lexicon and Tools; see [Sections 4](#) and [4.8](#) in this manual.

These entries represent the cases where LUIs identified by the previous release's luinorm program, when used to identify lexical variants in the previous Metathesaurus, are no longer found with this release's luinorm on this release's Metathesaurus. This does not necessarily imply the deletion of a string or a concept from the Metathesaurus.

Cols.

LUI Lexical Unique Identifier in the previous Metathesaurus

STR Preferred Name of Term in the previous Metathesaurus

2.7.1.2.19.6 Merged Terms (File=MERGED.LUI)

There is exactly one row in this file for each case in which strings had different Lexical Unique Identifiers (LUIs) in the previous Metathesaurus yet share the same LUI in this Metathesaurus; a LUI present in the previous Metathesaurus is therefore absent from this Metathesaurus.

Metathesaurus Lexical Unique Identifiers (LUIs) are assigned by the luinorm program, part of the LVG program in the UMLS SPECIALIST Lexicon and Tools; see Sections 4 and 4.8 in this manual.

These entries represent the cases where separate lexical variants as identified by the previous release's luinorm program version are a single lexical variant as identified by this release's luinorm.

Cols.

LUI Lexical Unique Identifier in the previous Metathesaurus but not present in this Metathesaurus
LUI Lexical Unique Identifier into which it was merged in this Metathesaurus

2.7.1.2.19.7 Deleted Strings (File=DELETED.SUI)

There is exactly one row in this file for each string in each language that was present in a entry in the previous Metathesaurus and does not appear in this Metathesaurus.

Note that this does not necessarily imply the deletion of a term (LUI) or a concept (CUI) from the Metathesaurus. A string deleted in one language may still appear in the Metathesaurus in another language.

Cols.

SUI String Unique Identifier in previous Metathesaurus that is not present in this Metathesaurus
LAT Three character abbreviation of language of string that has been deleted.
STR Preferred name of term in previous Metathesaurus that is not present in this Metathesaurus.

2.7.1.2.19.8 Retired CUI Mapping (File=MRCUI)

There are one or more rows in this file for each Concept Unique Identifier (CUI) that existed in any prior release but is not present in the current release. The file includes mappings to current CUIs as synonymous or to one or more related current CUI where possible. If a synonymous mapping can not be found, other relationships between the CUIs can be created. These relationships can be Broader (RB), Narrower (RN) or Other Related (RO). Some CUIs may be mapped to more than one other CUI using these relationships.

CUIs may be retired when (1) two released concepts are found to be synonyms and so are merged, retiring one CUI; (2) when the concept no longer appears in any source vocabulary and is not 'rescued' by NLM; or (3) where the concept is an acknowledged error in a source vocabulary or determined to be a Metathesaurus production error.

See the META/CHANGE files, especially MERGED.CUI and DELETED.CUI, for the changes from the last release only, without mappings.

Col.	Description
CUI1	Retired CUI - was present in some prior release, but is currently missing
VER	The last release version in which CUI1 was a valid CUI

CREL	The relationship CUI2 has to CUI1, if present, or DEL if CUI2 is not present. Valid values currently are SY, DEL, RO, RN, RB
CUI2	The current CUI that CUI1 most closely maps to.
MAPIN	Values of Y or N or null, used with MetamorphoSys to indicate excluded CUIs

Sample Records:

C0079138|2001|DEL||Y|
 C0079138|2001|RO|C0037440|Y|
 C0079151|1993|DEL||N|
 C0079158|1997|SY|C0009081||
 C0079167|1997|SY|C0010042|N|

2.7.1.2.20 Source Information (File=MRSAB)

Starting with 2002AD, the UMLS Metathesaurus has "versionless" or "root" Source Abbreviations (SABs) in the MR files. In each case, there is a link in MRSAB from the "root" SAB to fully specified version information for the current release. MetamorphoSys can produce files with either the root or versioned SABs so that either form can be utilized by a user.

For example, the released SAB for MeSH is now simply "MSH". In MRSAB, you will find the current versioned SAB is MSH2003_2002_10_24.

The major advantage of this change is that all MR file rows which represent information which has not changed between versions will also be unchanged, making an update model, using row updates, much simpler and smaller.

Detailed description of MRSAB:

There is one row in this file for every version of every source in the current Metathesaurus; when complete, there will also be historical information with a row for each version of each source that has appeared in any Metathesaurus release.

This table allows mapping from Root (versionless) source names and abbreviations (SABs) to versioned ones; the versioned source name row has the corresponding versionless names. Note that the field CURVER has the value 'Y' to identify the version in this Metathesaurus release. Future releases of MRSAB will also contain historical version information in rows with CURVER value 'N'.

MRSAB allows all other Metathesaurus files to use versionless source abbreviations, so that all rows with no data change between versions also remain unchanged. Note also that those who prefer versioned SABs may elect to have them as an output option in MetamorphoSys.

The full structure of MRSAB is as follows:

Field	Full Name	Description
VCUI	CUI	CUI of the versioned SRC concept for a source
RCUI	Root CUI	CUI of the root SRC concept for a source
VSAB	Versioned Source Abbreviation	The versioned source abbreviation for a source e.g. MSH2003_2002_10_24
RSAB	Root Source Abbreviation	The root source abbreviation for a source e.g MSH
SON	Official Name	The official name for a source
SF	Source Family	The Source Family for a source
SVER	Version	The source version e.g. 2001

VSTART	Valid Start Date For A Source	Source's start date for valid use, e.g. 2004_04_03
VEND	Valid End Date For A Source	Source's end date for valid use, e.g. 2003_05_10
IMETA	Meta Insert Version	The version of the Metathesaurus a source first appeared, e.g.2001AB
RMETA	Meta Remove Version	The version of the Metathesaurus a source was removed, e.g.2001AC
SLC	Source License Contact	The source license contact information
SCC	Source Content Contact	The source content contact information
SRL	Source Restriction Level	0,1,2,3
TFR	Term Frequency	The number of terms for this source in MRCON/MRSO, e.g., 12343
CFR	CUI Frequency	The number of CUIs associated with this source, e.g. 10234
CXTY	Context Type	The type of context (per section 2.3.2) from the UMLS documentation
TTYL	Term Type List	Term type list from source , e.g. MH,EN,PM,TQ
ATNL	Attribute Name List	The attribute name list (from MRSAT), e.g., MUI,RN,TH,...
LAT	Language	The language of the source
CENC	Character Encoding	Character set as specified by the IANA official names for character assignments http://www.iana.org/assignments/character-sets
CURVER	Current Version	A Y or N flag indicating whether or not this row corresponds to the current version of the named source
SABIN	Source in Subset	A Y or N flag indicating whether or not this row is represented in the current MetamorphoSys subset. Initially always Y where CURVER is Y, but later is recomputed by MetamorphoSys.

2.8 MetamorphoSys

2.8.1 Introduction

If you would like to see a tutorial on Customizing the Metathesaurus including how to use MetamorphoSys, please see:

<http://umlsinfo.nlm.nih.gov/education.html>

MetamorphoSys is a tool to customize and create subsets of the UMLS Metathesaurus for two purposes:

1. to exclude vocabularies as required for your use, under the UMLS License Agreement
2. to alter the Metathesaurus to better meet users' needs by excluding entire vocabularies, altering naming precedence or adding suppressibility to any source-term type or CUI|SUI combination.

To select vocabularies to exclude, check the License Agreement and Appendix A.1 of the documentation for a description of each vocabulary.

Note, for example, that CPT (the AMA's Physicians' Current Procedural Terminology, CPT4) is also a part of HCPT (the Health Care Financing Administration Common Procedure Coding System, HCPCS). Both vocabularies must be removed to exclude all sources of CPT information.

MetamorphoSys includes a self-contained Java program for configuration and Java subsetting. It has been tested to run on the following operating systems:

Sun Solaris 2.5.1

Windows XP
 Windows NT 4.0, Windows 2000
 Windows 98, Windows ME
 Red Hat Linux 7.1 (Intel x86)
 Mac O/S 10.2

We have successfully tested the Linux version of MetamorphoSys under Red Hat Linux 7.1. The Linux version comes with the 1.3 version of the Java2 JRE. The Java2 v1.3.0 for Linux requires a kernel with GLIBC 2.1.2 or greater.

This program takes from less than one hour to many hours to run on the systems tested (Sun Ultra 2 and PCs ranging from 200 to 866 MHz). Obviously, additional memory, large swap space, faster cpus, and faster disks help.

2.8.2 Space Requirements

The MetamorphoSys system requires that the full UMLS distribution be present on disk. Once you have uncompressed it, simply cd to the /METAMSYS directory and start the MetamorphoSys script as detailed below.

Space requirements for the full UMLS is approximately 4.0 GB. The full Metathesaurus occupies 3.6 GB. The subsetted Metathesaurus could (in the worst case of the smallest source being removed) take roughly another 3.6 GB, so total space requirements are 7.0 GB assuming no overhead.

We recommend a minimum of 8 GB free disk space to use MetamorphoSys. On NT systems the disk must be formatted as a NT file system (NTFS), since the limit on the partition size for FAT file systems is 2GB. For the same reason, Windows98 disks must be FAT32.

We recommend 256 MB of physical memory to run MetamorphoSys. Less will be likely to cause virtual memory swapping to disk and very slow performance; requirements depend to some extent on the number of concepts and strings in the subset, with smaller subsets requiring less memory.

2.8.3 How to Run

The MetamorphoSys system includes the Java Runtime Environment for each platform supported. A windowing system (not provided) is required to run the Java interface.

To start MetamorphoSys, simply go to the 2003AA/METAMSYS/ directory and execute the MetamorphoSys program (MetamorphoSys.sh in the UNIX and Linux environments, MetamorphoSys.bat in Windows; do not execute from other directories). The system will start a Java graphical user interface (window) that interactively prompts the user for information.

Main Tabs:

The interface is composed of four main "tabs" or filters:

The "Files/folders" tab allows the user to specify the source folder (directory) for the UMLS installation and the target folder where the subsetted files will be placed. The user can type the directory paths into the text boxes if the defaults are not desired. Alternatively, the user can "Browse" the file system structure by clicking on the appropriate button next to each listed folder. Additionally, the user can change the current configuration file by either typing into the "Current Configuration File" text box or by clicking on the "Browse" button next to that text box. The "CUI Input Handler" and "CUI Output Handler" are chosen from this tab as well. The user can choose the "Browse" button and select from the handler choices according to the format of the installation files and the desired output format.

CUI Input and Output Handlers

CUI Input handlers load the Metathesaurus data into the application based on the format of the input files (most likely MR files). CUI Output handlers are responsible for writing the subsetted data to the target folder in a particular format. There are two choices for input

handlers:

"Full MR Files Input Stream" - Reads standard MR file format. When performing the "initialize CUIs" stage of subsetting it reads all input MR files.

"Efficient MR Files Input Stream" - Reads standard MR file format. When performing the "initialize CUIs" stage of subsetting it reads only MRCON, MRSO, and MRSTY. This handler should be used for the default configuration, and any other configuration wherein filters will only cause an entire CUI to be removed from the output subset based on content in these three files.

There are two choices for output handlers:

"MR Files Output Stream" - This stream writes the standard MR Files.

"MR Files SQL*Loader Output Stream" - This stream writes standard MR files with a ".dat" extension at the end of each file name, to enable the files to be loaded into an Oracle database. Additionally, control file and schema scripts are also written to the subset directory along with a Windows batch file script and a UNIX c-shell script which can be used to transparently load create tables and load the data files into them. The user must configure the script with connection information before using it.

The "Sources To Exclude" tab can be brought to the front by clicking on it. This tab allows users to specify which sources (vocabularies) to exclude. Note that all sources with a Restriction Level greater than zero have been preselected for exclusion. Use <CTRL> mouse click to add another source to the selection, or to de-select a source. An option displayed on the "MetamorphoSys Options" window, described below, provide the capability to select multiple related sources for exclusion with a single click.

The "Precedence" tab allows the user to reorder the precedence of the sources. The default highest precedence source is the Metathesaurus itself (MTH). The name of a concept will be determined from the term with the highest ranking source/term type in the concept. Rows may be cut and pasted. To cut more than one row at a time, hold down the <CTRL> key while you make your selections. After all selections are made, press <CTRL-X>. To paste the rows, select the location where the rows will be pasted and press <CTRL-V>.

The "Term Status" tab allows the user to select which additional source and term type combinations to make suppressible. Users may then delete suppressible terms in their applications by using the "Advanced Term Status Options" window described below.

The "Sources to Exclude" and "Term Status" tables discussed above can all be sorted by the data in any particular table column when the column's header is selected. Additionally, all tables can be reverse sorted when a <Shift> mouse click is performed on the column's header. Sources that are selected on the "Sources To Exclude" tab will be removed from the other filter tabs because they will not be a part of the subset. Likewise they will be restored to the other filter tabs when they are deselected on the "Sources To Exclude" tab.

Additional Filters:

There are 4 new additional filters that can be used to customize the Metathesaurus based on additional criteria.

The "Attributes To Exclude Filter" allows users to specify attributes to exclude from the output subset. Use <Control> mouse click to (de)select source attributes from the table. This filter removes only attribute data and not entire concepts from the output subset. Term types from sources that have been excluded on the Sources To Exclude tab will not be visible on the Attributes To Exclude tab. When configuring this filter, (de)selecting an attribute type for removal will prompt the user with a list of all other attributes with the same source so they can also be (de)selected.

The "Languages To Exclude Filter" allows users to specify which languages to exclude from the output subset. All terms with the specified languages will be removed as well as all attributes and relationships connected to those terms. If all terms in a concept have languages on the list, then the entire concept will be removed from the output subset.

The "Relationship Types To Exclude Filter" allows users to specify which relationship types to exclude from the output subset. Use <Control> mouse click to (de)select source relationships from the table. This filter removes only relationship data and not entire concepts from the output subset. Term types from sources that have been excluded on the Sources To Exclude tab will not be visible on the Relationship Types To Exclude tab. When configuring this filter, selecting a relationship type for removal will prompt the user with a list of all other relationships with the same source so they can also be (de)selected.

The "Semantic Types To Exclude Filter" allows users to specify a list of semantic types to used for concept removal. The default behavior is to remove any concepts from the output subset containing at least one semantic type from the specified list. When configuring this filter, selecting a semantic type for removal will prompt the user with a list of all children of that semantic type so they can also be (de)selected.

Advanced Semantic Types To Exclude Options

Use "Options->Advanced Semantic Types To Exclude Options" to set choose the predicate for concept removal. There are two choices:

Remove CUIs containing at least one selected semantic type - If this option is selected, a concept will be removed if any of its semantic types appear on the exclude list.

Remove CUIs containing only selected semantic types - If this option is selected, a concept will be removed only if all of its semantic types are on the exclude list.

Reset Menu:

The "Reset" menu allows the user to reset the default selections for all of the filter tabs. The default selections are those listed in the mmsys.prop.default file in the config folder. The mmsys.prop.sav file contains the properties used in the last run of MetamorphoSys.

The Options menu allows the user to reset the default selections for the "Sources", "Precedence", or "Term Status" tables. The default selections are those listed in the mmsys.prop.default file in the config folder. The mmsys.prop.sav file contains the properties used in the last run of MetamorphoSys.

File Menu:

The user can choose to exit the program by the "Exit" option in the "File" menu. If changes have been made to the configuration, the user will be prompted to save those changes.

Menu items "Save Configuration" and "Open Configuration" are also available from the File Menu.

The "Enable/Disable Filter" option allows the user to turn on and off filters additional filters that have been included with MetamorphoSys. When a filter is disabled, its tab is no longer visible and when subsetting occurs, the filter is not used.

The "Import Filter" option allows the user to import filters developed according to the Filter API into the application. Filters cannot be exported or removed from the application. However, they can be disabled. A window will pop up with all filters available for import. These filters should be in the /ext directory.

Once the desired choices have been entered, the process of subsetting can be started by selecting the "Begin MetamorphoSys..." option from the File menu.

A progress monitor charts the subsetting progress. First the progress of the initializing CUI list is shown. Then the progress in subsetting the MR Files is shown and that is followed by the progress of the index file subsetting. Pressing cancel on the progress monitor window will cause the application to abort.

When the subsetting process is complete, simple progress messages, any errors encountered, and a listing of the configuration settings, are displayed to the screen and written to a log file called "mmsys.log" in the directory containing the subsetted files.

After the program completes, the 'subsetted' Metathesaurus files should be present in the chosen target directory.

****Note:** the STT field in the subsetted MRCON will not exactly match the ones in the original as these are computed without the full LVG machinery.

Edit Menu:

All user actions other than File menu options can be undone and redone by using the "Undo" and "Redo" options on the Edit Menu.

2.8.4 Advanced Users

Selecting the "Advanced Source To Exclude Options" item from the "Options" menu opens a configuration window which contains the following user capabilities.

1. Enforce Family Selection - If the "Enforce Family Selection" check-box is selected, the user will be prompted to select other sources that share the same "Source Family" as the source that the user clicked.

For example, if RCD is selected, the user will be provided with a list containing RCDAE, RCDSA, and RCDSY and will be given the opportunity to select those sources to be excluded as well because they share RCD as their Source Family. This works for deselection as well. To continue the example, if RCD is deselected, the user is given the opportunity to deselect RCDAE, RCDSA, and RCDSY as well. The default for this flag is true.

2. Enforce Dependent Source Selection - If the "Enforce Dependent Source Selection" check-box is selected and the user selects a source that appears in the "Dependent Source Associations" table in the "Advanced Options" window, the user will then be offered the option to additionally select any sources listed as dependent sources in that table. As with "Enforce Family Selection" this functionality exists for deselection of sources as well. The default for this flag is true.

Source/Dependent Source relationships can be added to the "Dependent Source Associations" table by clicking on the "Add" button. The user may clear the whole table by clicking on the "Clear" button. A specific line or lines can be removed from the table by selecting those lines and pressing the "Delete" button. The user may also sort the table either by clicking on the "Source" or "Dependent Source" table header. A reverse sort of the table can be done by pressing <Shift> while clicking on a table header. The user may exit the "Advanced Options" dialog by clicking on the "Done" button at the bottom of the window.

Selecting the "Term Status Advanced Options" item from the "Options" menu opens a configuration window which contains the following user capability.

Remove Suppressible Data - If the "Remove Suppressible Data" check-box is selected, all data in which the term status is ts='s' or ts='p' in MRCON will be removed from the result set. For example, the following row would be among those removed.

```
C0000731|ENG|s|L0658950|PF|S0835542|Change in abd size/distension|0|
```

The corresponding rows will be removed from other files containing the same CUI,SUI. If this operation causes all rows for a CUI to be removed in MRCON, that entire CUI will be excluded from the result set for the other files. The default for this flag is false.

Selecting the "MetamorphoSys Options" item from the "Options" menu opens a configuration window which contains the following user capability.

Auto Select Related Items - If this check-box is selected, the user is not prompted when the selected row shares a Source Family or has a Dependent Source. The system selects the Dependent Source rows or the rows with the same Source Family automatically. The default for this flag is false.

Other Advanced Options menu items may be present. This is dependent on which filters are enabled.

API Documentation:

To help users develop custom filters, the MetamorphoSys API documentation (generated with javadoc) can be found starting with the file METAMSYS/doc/index.html in your installation directory. Sample filters using this API can be found in the METAMSYS/ext directory. You can also find more information on the World-Wide Web at:

<http://umlsinfo.nlm.nih.gov/mmsys.html>

Version Validation:

In order to ensure that the correct versions of sources are removed during subsetting, it is required that the MetamorphoSys distribution release match the release of the data. The release version of MetamorphoSys can be found on the title bar of the application. This release version should match the version in the release.dat file. The release.dat file should be at the same directory level as the installation directory and at the same level as the METAMSYS directory. Otherwise, it should match the name of the directory above the installation and METAMSYS directories.

2.8.5 Getting Help

Check the information available at:

<http://umlsinfo.nlm.nih.gov>

and especially:

<http://umlsinfo.nlm.nih.gov/mmsys.html>

While the MetamorphoSys is not a supported NLM product, NLM does maintain a listserv (electronic mailing list service) called umls-users where requests for help may be sent.

To subscribe to the listserv, send a message to

listserv@nlm.nih.gov

which includes the following line:

subscribe umls-users

To post a message to the umls-users listserv AFTER subscribing, send email to:

umls-users@lhc.nlm.nih.gov

We are also developing web resources for UMLS users; start your searches at:

<http://www.nlm.nih.gov/research/umls/>

2.8.6 Acknowledgments

Solaris and Windows Java Runtime Environment: <http://www.javasoft.com>

Linux Java Runtime Environment: <http://www.blackdown.org>

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SECTION 3 UMLS® SEMANTIC NETWORK

3.0 Introduction

The UMLS Semantic Network provides a consistent categorization of all concepts represented in the UMLS Metathesaurus and the important relationships between them. This section of the documentation provides an overview of the Semantic Network, as well as information about the Network's semantic types and semantic relationships. The files that contain this information are described, and sample records give the reader an indication of the structure and content of each of the files.

3.1 Overview

The purpose of the Semantic Network is to provide a consistent categorization of all concepts represented in the UMLS Metathesaurus and to provide a set of useful relationships between these concepts. All information about specific concepts is found in the Metathesaurus; the Network provides information about the set of basic semantic types, or categories, which may be assigned to these concepts, and it defines the set of relationships that may hold between the semantic types. The 2003AC release of the Semantic Network contains 135 semantic types and 54 relationships. The Semantic Network serves as an authority for the semantic types that are assigned to concepts in the Metathesaurus. The Network defines these types, both with textual descriptions and by means of the information inherent in its hierarchies.

The semantic types are the nodes in the Network, and the relationships between them are the links. There are major groupings of semantic types for organisms, anatomical structures, biologic function, chemicals, events, physical objects, and concepts or ideas. The current scope of the UMLS semantic types is quite broad, allowing for the semantic categorization of a wide range of terminology in multiple domains.

The Metathesaurus consists of terms from its controlled source vocabularies. The meaning of each term is defined by its source, explicitly by definition or annotation; by context (its place in a hierarchy); by synonyms and other stated relationships between terms; and by its usage in description, classification, or indexing. Each Metathesaurus concept is assigned at least one semantic type. In all cases, the most specific semantic type available in the hierarchy is assigned to the concept. For example, the concept "Macaca" receives the semantic type "Mammal" because there is not a more specific type "Primate" available in the Network. The level of granularity varies across the Network. This has important implications for interpreting the meaning (i.e., semantic type) that has been assigned to a Metathesaurus concept. For example, a sub-tree under the node "Physical Object" is "Manufactured Object". It has only two child nodes, "Medical Device" and "Research Device". It is clear that there are manufactured objects other than medical devices and research devices. Rather than proliferate the number of semantic types to encompass multiple additional subcategories for these objects, concepts that are neither medical devices nor research devices are simply assigned the more general semantic type "Manufactured Object".

Figure 1 illustrates a portion of the Network. The semantic type "Biologic Function" has two children, "Physiologic Function" and "Pathologic Function", and each of these in turn has several children and grandchildren. Each child in the hierarchy is linked to its parent by the "isa" link.

The primary link in the Network is the "isa" link. This establishes the hierarchy of types within the Network and is used for deciding on the most specific semantic type available for assignment to a Metathesaurus concept. In addition, a set of non-hierarchical relations between the types has been identified. These are grouped into five major categories, which are themselves relations: "physically related to", "spatially related to", "temporally related to", "functionally related to", and "conceptually related to".

Figure 2 illustrates a portion of the hierarchy for Network relationships. The "affects" relationship, one of several functional relationships, has six children, including "manages", "treats", and "prevents".

The relations are stated between high level semantic types in the Network whenever possible and are generally inherited via the "isa" link by all the children of those types. Thus, for example, the relation "process of" is stated to hold between the semantic types "Biologic Function" and "Organism". Therefore, it also holds between "Organ or Tissue Function" (which is a "Physiologic Function", which is, in turn, a "Biologic Function") and "Animal" (which is an "Organism"). The relations are stated between semantic types and do not necessarily apply to all instances of concepts that have been assigned to those semantic types. That is, the relation may or may not hold between any particular pair of concepts. So, though the relation "evaluation of" holds between the semantic types "Sign" and "Organism Attribute", a particular sign or a particular attribute may not be linked by this relation. Thus, signs such as "overweight" and "fever" are evaluations of the organism attributes "body weight" and "body temperature", respectively. However, "overweight" is not

an evaluation of "body temperature", and "fever" is not an evaluation of "body weight".

In some cases there will be a conflict between the placement of types in the Network and the link to be inherited. If this is so, the inheritance of the link is said to be blocked. For example, by inheritance, the type "Mental Process" would be "process of" "Plant". Since plants are not sentient beings, this link is explicitly blocked. In other cases the nature of the relation is such that it should not be inherited by the children of the types that it links. In that case, the relation is defined for the two semantic types it explicitly links, but blocked for all the children of those types. For example, "conceptual part of" links "Body System" and "Fully Formed Anatomical Structure", but it should not link "Body System" to all the children of "Fully Formed Anatomical Structure", such as "Cell" or "Tissue".

Several portions of the MeSH hierarchy have been labeled with child to parent semantic relationships. All of the anatomy, diseases, and psychiatry and psychology sections have been labeled, as well as a portion of the biological sciences section. The links that are expressed between MeSH terms are, with a few exceptions, reflected in the Semantic Network. That is, if two MeSH terms are linked by a certain relation, then that link is expressed in the Network as a link between the semantic types that have been assigned to those MeSH terms. For example, "Amniotic Fluid", which is a "Body Substance", is a child of "Embryo", which is an "Embryonic Structure". The labeled relationship between "Amniotic Fluid" and its parent "Embryo" is "surrounds". This is allowable, since the relation "Body Substance surrounds Embryonic Structure" is represented in the Network.

[Figure 3](#) shows a portion of the Semantic Network, illustrating the relations, either hierarchical or associative, that exist between semantic types.

The UMLS Semantic Network is provided in two formats: a relational table format and a unit record format.

3.2 Semantic Network ASCII Relational Format

There are two basic tables, two ancillary tables, and two bookkeeping tables included in this format. The two basic tables contain exactly the same information as the unit record file, but the information is presented somewhat differently. One table contains definitional information about the semantic types and relations; the other contains information about the structure of the Network. Each semantic type and each relation has been assigned a four character unique identifier (UI). These are of the form "T001", "T002", etc. The ancillary tables are expansions of the table that contains the Network structure. They give the fully inherited set of links represented in the Network. The first table is expressed as triples of UI's. The second is expressed as triples of names. The two bookkeeping tables describe the relational files and their fields. Fields in all tables are separated by a "|". All tables are listed and described below:

Table	Description
SRDEF	Basic information about the Semantic Types and Relations.
SRSTR	Structure of the Network.
SRSTRE1	Fully inherited set of Relations (UI's).
SRSTRE2	Fully inherited set of Relations (names).
SRFIL	Description of each table.
SRFLD	Description of each field and the table(s) in which it is found.

Specific Descriptions of each Table:

Table: SRDEF

RT:	Record Type (STY = Semantic Type or RL = Relation).
UI:	Unique Identifier of the Semantic Type or Relation.
STY/RL:	Name of the Semantic Type or Relation.
STN/RTN:	Tree Number of the Semantic Type or Relation.
DEF:	Definition of the Semantic Type or Relation.
EX:	Examples of Metathesaurus concepts with this Semantic Type (STY records only).

or one that is abnormal in size or location, found in or deriving from a previously normal structure. Acquired abnormalities are distinguished from diseases even though they may result in pathological functioning (e.g., "hernias incarcerate").|Abscess of prostate; Hemorrhoids; Hernia, Femoral; Varicose Veins||||
 STY|T052|Activity|B1|An operation or series of operations that an organism or machine carries out or participates in.|Social Planning; Expeditions; Information Distribution; Return Migration|Few concepts will be assigned to this broad type. Wherever possible, one of the more specific types from this hierarchy will be chosen.

For concepts assigned to this type, the focus of interest is on the activity. When the focus of interest is the individual or group that is carrying out the activity, then a type from the 'Behavior' hierarchy will be chosen. In general, concepts will not receive a type from both the 'Activity' and the 'Behavior' hierarchies.||||

STY|T100|Age Group|A2.9.4|An individual or individuals classified according to their age.|Adult; Infant, Premature; Adolescents; Aged, 80 and over||||

STY|T003|Alga|A1.1.1.1|A chiefly aquatic plant that contains chlorophyll, but does not form embryos during development and lacks vascular tissue.|Chlorella; Laminaria; Seaweed||||

RL|T173|adjacent_to|R2.2|Close to, near or abutting another physical unit with no other structure of the same kind intervening. This includes adjoins, abuts, is contiguous to, is juxtaposed, and is close to.||||AD|adjacent_to|

RL|T151|affects|R3.1|Produces a direct effect on. Implied is the altering or influencing of an existing condition, state, situation, or entity. This includes has a role in, alters, influences, predisposes, catalyzes, stimulates, regulates, depresses, impedes, enhances, contributes to, leads to, and modifies.||||AF|affected_by|
 ::::::::::::::

SRSTR

::::::::::::
 Acquired Abnormality|co-occurs_with|Injury or Poisoning|D|
 Acquired Abnormality|isa|Anatomical Abnormality|D|
 Acquired Abnormality|result_of|Behavior|D|
 Activity|isa|Event|D|
 Age Group|isa|Group|D|
 Alga|isa|Plant|D|
 ::::::::::::::

SRSTRE1

::::::::::::
 T020|T186|T190|
 T020|T186|T017|
 T020|T186|T072|
 T052|T186|T051|
 T052|T165|T090|
 T052|T165|T091|
 T100|T186|T096|
 T100|T186|T077|
 T100|T186|T071|
 T003|T186|T002|
 T003|T186|T001|
 T003|T186|T072|
 ::::::::::::::

- UN: Usage note for Semantic Type assignment (optional field).
 NH: Semantic Type and its descendants allow the non-human flag (optional field).
 HL: Hierarchical links of the Semantic Type to its parent({isa})and its children ({inverse_isa}). If there are no hierarchical links, then the value <none> is assigned.

Relation records contain the following fields:

Field	Description
UI:	Unique Identifier of the Relation.
RL:	Name of the Relation.
ABR:	Abbreviation of the Relation.
RIN:	Name of the inverse of the Relation.
RTN:	Tree Number of the Relation.
DEF:	Definition of the Relation.
INH:	"N" if the relation is not inherited (optional field).
HL:	Hierarchical links of the Relation to its parent ({isa}) and its children ({inverse_isa}). If there are no hierarchical links, then the value <none> is assigned.
STL:	Semantic Types linked by this Relation. N.B.: These are binary relations and the arguments are ordered pairs. The relations are stated only for the top-most node of the "isa" hierarchy of the Semantic Types to which they may apply. This field does not appear in the "isa" relation record since its values can be computed from the "HL" field. If there are no semantic types linked by this Relation, then the value <none> is assigned.
STLB:	Semantic Types linked by this Relation are blocked (optional field).

Sample Unit Records

```
::::::::::::
```

```
SU
```

```
::::::::::::
```

```
UI: T020
```

```
STY: Acquired Abnormality
```

```
STN: A1.2.2.2
```

```
DEF: An abnormal structure, or one that is abnormal in size or location,
found in or deriving from a previously normal structure. Acquired
abnormalities are distinguished from diseases even though they may
result in pathological functioning (e.g., "hernias incarcerate").
```

```
EX: Abscess of prostate; Hemorrhoids; Hernia, Femoral; Varicose Veins
```

```
HL: {isa} Anatomical Abnormality
```

```
UI: T052
```

```
STY: Activity
```

```
STN: B1
```

```
DEF: An operation or series of operations that an organism or machine
carries out or participates in.
```

```
EX: Social Planning; Expeditions; Information Distribution; Return Migration
```

```
UN: Few concepts will be assigned to this broad type. Wherever possible, one of the
more specific types from this hierarchy will be chosen. For concepts assigned
to this type, the focus of interest is on the activity. When the focus of
interest is the individual or group that is carrying out the activity, then a
type from the 'Behavior' hierarchy will be chosen. In general, concepts will
```

not receive a type from both the 'Activity' and the 'Behavior' hierarchies.

HL: {isa} Event;
 {inverse_isa} Behavior;
 {inverse_isa} Daily or Recreational Activity;
 {inverse_isa} Occupational Activity;
 {inverse_isa} Machine Activity

UI: T100

STY: Age Group

STN: A2.9.4

DEF: An individual or individuals classified according to their age. EX: Adult;
 Infant, Premature; Adolescents; Aged, 80 and over

HL: {isa} Group

UI: T003

STY: Alga

STN: A1.1.1.1

DEF: A chiefly aquatic plant that contains chlorophyll, but does not form embryos during development and lacks vascular tissue.

EX: Chlorella; Laminaria; Seaweed

HL: {isa} Plant

UI: T173

RL: adjacent_to

ABR: AD

RIN: adjacent_to

RTN: R2.2

DEF: Close to, near or abutting another physical unit with no other structure of the same kind intervening. This includes adjoins, abuts, is contiguous to, is juxtaposed, and is close to.

HL: {isa} spatially_related_to

STL:

[Body Location or Region|Body Location or Region];
 [Body Location or Region|Body Part, Organ, or Organ Component];
 [Body Location or Region|Body Space or Junction];
 [Body Part, Organ, or Organ Component|Body Part, Organ, or Organ Component];
 [Body Part, Organ, or Organ Component|Body Space or Junction];
 [Body Part, Organ, or Organ Component|Cell];
 [Body Part, Organ, or Organ Component|Tissue];
 [Body Space or Junction|Body Space or Junction];
 [Cell Component|Body Space or Junction];
 [Cell Component|Cell Component];
 [Cell|Cell];
 [Tissue|Body Space or Junction];
 [Tissue|Tissue]

UI: T151

RL: affects

ABR: AF

RIN: affected_by

RTN: R3.1

DEF: Produces a direct effect on. Implied here is the altering or influencing of an existing condition, state, situation, or entity. This includes has a role in, alters, influences, predisposes, catalyzes, stimulates, regulates, depresses, impedes, enhances, contributes to, leads to, and modifies.

```
HL:  {isa} functionally_related_to;
      {inverse_isa} manages;
      {inverse_isa} treats;
      {inverse_isa} disrupts;
      {inverse_isa} complicates;
      {inverse_isa} interacts_with;
      {inverse_isa} prevents
```

```
STL:
      [Natural Phenomenon or Process|Natural Phenomenon or Process];
      [Anatomical Abnormality|Physiologic Function];
      [Biologic Function|Organism];
      [Anatomical Abnormality|Organism];
      [Health Care Activity|Biologic Function];
      [Diagnostic Procedure|Patient or Disabled Group];
      [Therapeutic or Preventive Procedure|Patient or Disabled Group];
      [Chemical|Natural Phenomenon or Process];
      [Gene or Genome|Physiologic Function];
      [Cell Component|Physiologic Function];
      [Physiologic Function|Organism Attribute];
      [Food|Biologic Function];
      [Behavior|Behavior];
      [Behavior|Mental Process];
      [Mental Process|Behavior];
      [Mental or Behavioral Dysfunction|Behavior];
      [Research Activity|Mental Process];
      [Regulation or Law|Group];
      [Regulation or Law|Organization]
```

3.4 Hierarchies for Semantic Types and Relations In the Semantic Network

[Current Semantic Types](#)

[Current relations in the Semantic Network](#)

[Return to Table of Contents](#)

SECTION 4

THE SPECIALIST LEXICON AND LEXICAL PROGRAMS

4.0 Introduction

The SPECIALIST lexicon has been developed to provide the lexical information needed for the SPECIALIST Natural Language Processing System (NLP). It is intended to be a general English lexicon that includes many biomedical terms. Coverage includes both commonly occurring English words and biomedical vocabulary. The lexicon entry for each word or term records the syntactic, morphological, and orthographic information needed by the SPECIALIST NLP System.

The lexical tools are designed to address the high degree of variability in natural language words and terms. Words often have several inflected forms which would properly be considered instances of the same word. The verb "treat", for example, has three inflectional variants: "treats " the third person singular present tense form, "treated" the past and past participle form, and "treating" the present participle form. Multi-word terms in the Metathesaurus and other controlled vocabularies may have word order variants in addition to their inflectional and alphabetic case variants. The lexical tools allow the user to abstract away from this sort of variation.

For an overview of the SPECIALIST lexicon, lexical variant programs, and lexical databases, see "Lexical Methods for Managing Variation in Biomedical Terminologies", A.T. McCray, S. Srinivasan, A.C. Browne, in the Proceedings of the 18th Annual Symposium on Computer Applications in Medical Care, 1994, 235-239.

4.1 General Description

The lexicon consists of a set of lexical entries with one entry for each spelling or set of spelling variants in a particular part of speech. Lexical items may be "multi-word" terms made up of other words if the multi-word term is determined to be a lexical item by its presence as a term in general English or medical dictionaries, or in medical thesauri such as MeSH. Expansions of generally used acronyms and abbreviations are also allowed as multi-word terms.

The unit lexical record is a frame structure consisting of slots and fillers. Each lexical record has a base= slot whose filler indicates the base form, and optionally a set of spelling_variants= slots to indicate spelling variants. An "entry=" slot records the unique identifier (EUI) of the record. EUI numbers are seven digit numbers preceded by an "E". Each record has a cat= slot indicating part of speech. The lexical record is delimited by braces ({...}).

The unit lexical records for "anaesthetic" given below illustrate some of the features of the SPECIALIST lexical record:

```
{base=anesthetic
spelling_variant=anaesthetic
entry=E0330018
    cat=noun
    variants=reg
    variants=uncount
}
{base=anesthetic
spelling_variant=anaesthetic
entry=E0330019
    cat=adj
    variants=inv
    position=attrib(3)
    position=pred
    stative
}
```

The base form "anesthetic" and its spelling variant "anaesthetic" appear in two lexical records, one an adjective entry, the other a noun entry. The variants= slot contains a code indicating the inflectional morphology of the entry; the filler reg in the noun entry indicates that the noun "anesthetic" is a count noun which undergoes regular English plural formation ("anaesthetics"); inv in the variants= slot of the adjective entry indicates that the adjective "anesthetic" does not form a comparative or superlative. The position= slot indicates that the adjective "anaesthetic" is attributive and appears after color adjectives in the normal adjective order. "pred" in the position slot of the adjective entry indicates that this adjective can appear in predicate position.

Lexical entries are not divided into senses. Therefore, an entry represents a spelling-category pairing regardless of semantics. The noun "act" has two senses both which show a capitalized and lower case spelling; an act of a play and an act of law. Since both senses share the same spellings and syntactic category, they are represented by a single lexical entry in the current lexicon. The unit record for "Act" is shown below.

```
{base=Act
spelling_variant=act
entry=E0000154
    cat=noun
    variants=reg
}
```

When different senses have different syntactic behavior, codes for each behavior are recorded in a single entry. For example, "beer" has two senses: the alcoholic beverage and the amount of a standard container of that beverage.

- A. Patients who drank beer recovered more slowly than patients who drank wine.
- B. Fifty-six patients reported drinking more than five beers a day.

The first sense illustrated in A. above is a mass (uncount) noun. The second sense illustrated in B. is a regular (count) noun. In cases like this the appropriate codes for both senses are included in the entry.

```
{base=beer
entry=E0012226
    cat=noun
    variants=uncount
    variants=reg
}
```

Two codes will also appear in cases where the lexical item is both count and uncount without a sense distinction. "Abdominal delivery" denotes the same procedure whether it appears as an uncount noun as in C. or a count noun as in D.

- C. Abdominal delivery is the procedure of choice in this situation.
- D. Abdominal deliveries are more common these days.

The unit lexical record for "abdominal delivery" includes both codes.

```
{base=abdominal delivery
entry=E0006453
    cat=noun
    variants=uncount
    variants=reg
signature=stavri
}
```

Other syntactic codes such as complement codes for verbs, adjectives and nouns are similarly grouped without regard to sense.

4.2 The Scope of the Lexicon

Words are selected for lexical coding from a variety of sources. Approximately 20,000 words from the UMLS Test Collection of MEDLINE abstracts together with words which appear both in the UMLS Metathesaurus and Dorland's Illustrated Medical Dictionary form the core of the words entered. In addition, an effort has been made to include words from the general English vocabulary. The 10,000 most frequent words listed in The American Heritage Word Frequency Book and the list of 2,000 words used in definitions in Longman's Dictionary of Contemporary English have also been coded. Since the majority of the words selected for coding are nouns, an effort has been made to include verbs and adjectives by identifying verbs in current MEDLINE citation records, by using the Computer Usable Oxford Advanced Learner's Dictionary, and by identifying potential adjectives from Dorland's Illustrated Medical Dictionary using heuristics developed by McCray and Srinivasan (1990).

A variety of reference sources are used in coding lexical records. Coding is based on actual usage in the UMLS Test Collection and MEDLINE, dictionaries of general English, primarily learner's dictionaries which record the kind of syntactic information needed for NLP, and medical dictionaries. Longman's Dictionary of Contemporary English, Dorland's Illustrated Medical Dictionary, Collins COBUILD Dictionary, The Oxford Advanced Learner's Dictionary, and Webster's Medical Desk Dictionary were used.

The SPECIALIST lexicon also exists in an ASCII relational format generated from the unit records. The full SPECIALIST lexicon technical report entitled "The SPECIALIST Lexicon", found in the file techrpt.pdf, fully describes the unit record format. The remainder of the present section describes the ASCII relational form of the lexicon. [Section 4.3](#) describes the Data elements that make up the relational tables and [Section 4.4](#) describes the tables.

4.3 Lexicon Data Elements

Each of the elements below are represented as fields (columns) in the ASCII relational format.

4.3.1 String Properties

These data elements refer to properties of the strings generated by the entries.

4.3.1.1 STR - String

A Lexical entry generates a variety of forms (strings) including all the inflectional forms (the citation form, as well) of each spelling variant. Case, punctuation and spaces are considered significant.

4.3.1.2 AGR - Agreement/Inflection Code

This element encodes agreement and inflection information.

Agreement between nouns and verbs and between determiners and nouns involves person and number. Person and Number are indicated by the following codes.

Code	Person	Number
second	Second	Singular & Plural
third	Third	Singular & Plural
fst_sing	First	Singular
fst_plur	First	Plural
thr_sing	Third	Singular
thr_plur	Third	Plural

For Nouns, the agreement/inflection code indicates countability, person and number. Person and number are indicated by the person/number codes given above which are parenthesized after the countability code. Nouns can be either count or uncount.

For Pronouns, the agreement/inflection indicates person and number using the codes given above.

For verbs, including auxiliaries and modals, the agreement/inflection code indicates tense, person and number. Persons and numbers are indicated by the same person/number codes given above. These codes are parenthesized after the tense. No person number codes are given for non-finite tenses. "pres(thr_sing)" indicates third person singular present tense and "pres(fst_sing,fst_plur,thr_plur,second)" indicates present tense for all persons and numbers other than third singular. Negative forms of auxiliaries (didn't) and modals (can't) have "negative" after a colon at the end of the agreement/inflection code.

Code	Tense
past	Past Tense
pres	Present Tense
past_part	Past Participle
pres_part	Present Participle
infinitive	Infinitive

Determiners agree with nouns in terms of countability and number. The agreement/inflection codes for determiners are "free", "plur", "sing" and "uncount". "free" indicates that the determiner places no restrictions on its noun. Determiners marked "plur" allow plural nouns, those marked "sing" allow singular nouns and those marked "uncount" allow uncount nouns.

4.3.1.3 CAS - Case

See Section 4.3.1 of "The SPECIALIST Lexicon".

Pronouns in English may be in one of two cases, subjective (nominative) or objective (accusative). This field contains "subj", "obj" or both separated by a comma to indicate the case of the pronoun.

4.3.1.4 GND - Gender

This field indicates the gender of pronouns.

Pronouns may be marked pers or neut to indicate whether they refer to people or non-people respectively. Pronouns marked pers may be masculine (masc) or feminine (fem) referring to male or female people respectively. See Section 14.2 of "The SPECIALIST Lexicon". There are four codes possible in this field:

Code	Gender
pers	person
neut	neuter
pers(masc)	person masculine
pers(fem)	person feminine

Notice that pers as used here does not correspond to the traditional term "personal pronoun". For example "it" and "they" are

traditionally called personal pronouns since they both participate in the person/number paradigm. A pronoun like "none" is not traditionally called a personal pronoun.

4.3.2 Entry Properties

4.3.2.1 EUI - Unique Identifier Number for Lexical Entries

The EUI identifies a lexical entry. Information about a set of spelling variants in a particular part of speech is represented as an entry in the unit record. A particular string may be assigned several EUI numbers as it may occur in several parts of speech.

4.3.2.2 CIT - Citation Form

This field records the citation form of strings in the agreement/inflection table (Iragr). The citation form is the singular for nouns, infinitive for verb and positive for adjectives and adverbs. The base form and the spelling variants if any are the citation forms of each of their respective inflections. This form is sometimes referred to as the un-inflected form.

4.3.2.3 BAS - Base Form

This field records the base form of a lexical entry. The base form is the citation form of one of a set of spelling variants chosen to represent the whole set. It might be thought of as the name of a lexical entry. The base form is the filler of the base= slot.

4.3.2.4 SCA - Syntactic Category

The syntactic category (part of speech) of the lexical entry. This field may be filled by one of the following. See Section 3 of "The SPECIALIST Lexicon".

Code	Category
noun	nouns
adj	adjectives
adv	adverbs
pron	pronouns
verb	verbs
det	determiners
prep	prepositions
conj	conjunctions

aux	auxiliaries
modal	modals
compl	complementizers

4.3.2.5 PER - Periphrastic

The code "periph" in this field indicates that an adjective or adverb is periphrastic. An adjective is periphrastic if it can form its comparative with "more" and its superlative with "most". See Section 4.3.5 of "The SPECIALIST Lexicon" for discussion.

4.3.2.6 COM - Complements

These are complement codes. See Sections 5.1, 5.2, 5.4 and 5.5 in "The SPECIALIST Lexicon" for a description of SPECIALIST complement codes.

4.3.2.7 TYP - Inflectional Type

The inflectional type(s) of an entry indicate the ways in which its forms may be inflected, or in the case of determiners the inflection of the heads they may determine. These codes are used to generate the variant strings (STR) found in other tables.

For nouns the following types may appear:

Code	Pluralization Pattern	See "The SPECIALIST Lexicon" Section
reg	regular	4.5.2
ggreg	Greco-Latin regular	4.5.3
metareg	metalinguistic regular	4.5.4
irreg()	irregular	4.5.5
sing	fixed singular	4.5.6
plur	fixed plural	4.5.7
inv	invariant	4.5.8
group(irreg())	group irregular	4.5.9
group(reg)	group regular	4.5.9

uncount	uncountable	4.5.10
groupuncount	group uncount	4.5.11

For verbs the following types may appear:

Code	Inflection Type	See "The SPECIALIST Lexicon" Section
reg	regular	4.1.1
regd	regular doubling	4.1.2
irreg()	irregular	4.1.3

For pronouns the following types may appear:

Code	Inflection Type
fst_plur	first person plural
fst_sing	first person singular
sec_plur	second person plural
sec_sing	second person singular
second	second person
third	third person
thr_plur	third person plural
thr_sing	third person singular

See Section 14.1 of "The SPECIALIST Lexicon".

For adjectives and adverbs the following types can appear:

Code	Inflectional Type	See "The SPECIALIST Lexicon" Section
reg	regular	4.3.1 and 4.4.1
regd	regular doubling	4.3.2
inv	invariant	4.3.4 and 4.4.3
inv;periph	periphrastic	4.3.5 and 4.4.4
irreg()	irregular	4.3.3 and 4.4.2

For determiners the infection type indicates the inflection of the noun heads they may determine. The following types may appear:

Code	Inflectional Type	See "The SPECIALIST Lexicon" Section
sing	singular	4.7.1
plur	plural	4.7.2
uncount	uncount	4.7.3
singuncount	singular uncount	4.7.4
pluruncount	plural uncount	4.7.5
free	free	4.7.6

4.3.2.8 POS - Possession

English pronouns may be possessive, or possessive nominal. The codes poss, possnom or both (comma separated) may appear in this field.

See Section 14.3.2 of "The SPECIALIST Lexicon".

4.3.2.9 QNT - Quantification

This field indicates the quantification properties inherent in certain pronouns. The four codes possible in this field are:

Code	Properties
univ	universal quantification
indef(nonassert)	non-assertive indefinite
indef(neg)	negative indefinite
indef(assert)	assertive indefinite

See Section 14.3.4 in "The SPECIALIST Lexicon" for discussion of quantification in pronouns.

4.3.2.10 FEA - Features

This field represents various features of terms in various categories. The possible features are:

Feature	Section of "The SPECIALIST Lexicon"
reflexive	14.3.3
negative	14.3.4
demonstrative	14.3.5
interrogative	12.1
proper	8.
negative	13.1
broad_negative	13.2
stative	10.

4.3.2.11 PSN - Position for Adjectives

Adjectives are marked in the SPECIALIST lexicon with position codes showing whether they are attributive postmodifying or predicative. If attributive, the code indicates where they appear in the pre-nominal sequence of adjectives. An additional attributive code, attribc, is used to indicate adjectives which can take complements in attributive position. One or more of the following codes can appear:

Code	Position	See "The SPECIALIST Lexicon" Section
attrib(1)	attributive (1st position)	9.1.1.1
attrib(2)	attributive (2nd position)	9.1.1.2
attrib(3)	attributive (3rd position)	9.1.1.3
attribc	attributive with complement	9.1.2
post	post modifying	9.2
pred	predicative	9.3

4.3.2.12 MOD - Modification Type for Adverbs

Adverbs are marked in the SPECIALIST lexicon to indicate their modification type. The possible values of this field are:

Code	See "The SPECIALIST Lexicon" Section
intensifier	11.2
particle	11.1
sentence_modifier; TYPE	11.3
verb_modifier; TYPE	11.4

TYPE is one of locative, temporal or manner. See Section 11.5 in "The SPECIALIST Lexicon".

4.3.2.13 GEN - Generic Name for a Trademark

The GEN field represents a generic or public name for the thing referred to by the trademark. The trademark "Alphalin" has the generic term "vitamin A".

4.3.3 Entry Relations

4.3.3.1 ABR - Acronym or Abbreviation

This field indicates whether a term listed in the acronym-abbreviation table (lraabr) is an acronym or abbreviation. It contains either:

"abbreviation_of" or "acronym_of".

4.3.3.2 SPV - Spelling Variant

A base form in the SPECIALIST lexicon may have one or more spelling variants, subject to the same inflectional pattern. This field contains the citation form of a particular spelling variant. See Section (2) of "The SPECIALIST Lexicon".

4.3.4 Data Description

The data elements describe the relational table files or provide index entries into the lexicon.

4.3.4.1 WRD - Word

Each string is broken into "words" and indexed in lrwd. Words are strings of alpha-numeric characters more than one character long, separated by space or punctuation.

4.3.4.2 DES - Description

A short definition of a file or field. This is free text.

4.3.4.3 FMT - Format

An ordered comma separated list of field names appearing in a file.

4.3.4.4 RWS - Number of Rows

The number of Rows (lines or records) in a file.

4.3.4.5 FIL - File Name(s)

One or more file names denoting the files containing relational tables.

4.3.4.6 BTS - Size in Bytes

The size of a file in bytes (characters).

4.3.4.7 CLS - Number of Columns

The number of columns (fields) in a record (or row) of a table. The same number as the number of lines in the file.

4.3.4.8 COL - Three Letter Field Name

A three letter identifier for a field.

4.3.4.9 REF - Cross Reference to Document

A cross reference to a section of this document.

4.4 Lexicon ASCII Relational Tables

4.4.1 Introduction

In this format the data in each lexical entry is represented in ten different "relations" or "tables" each in a file.

The Lexicon relational format is not fully normalized. By design, there is duplication of data among different relations and within certain relations. Developers will need to make their own decisions about the extent to which this redundancy should be retained, reduced, or increased for their specific applications.

4.4.2 General Description of the Relational Format

As in the Metathesaurus ASCII relational format, each relation or table of data values has by definition a fixed number of columns; the number of rows depends on the content of a particular version of the Lexicon. A column is a sequence of all the values in a given data element or logical sub-element. In general, columns for longer variable length data elements will appear to the right of columns for shorter and/or fixed length data elements. A row contains the values for one or more data elements or logical sub-elements for one Lexicon entry or string. Depending on the nature of the data elements involved, each Lexicon entry or string may have one or more rows in a given file. The values for the different data elements or logical sub-elements represented in the row are separated by vertical bars (|). If an optional element is blank, the vertical bars are still used to maintain the correct positioning of the subsequent elements. Each row is terminated by a vertical bar and a carriage return followed by a line feed. (|<CR><LF>).

4.4.3 Summary of the Contents of Each of the Relational Files

In the following descriptions, the numbers in parentheses beside each element refer to the section of this document that describes the element's contents.

4.4.3.1 - Agreement and Inflection (File = lragr)

Rows of the agreement table have six fields. There is a row in lragr for each inflected form of each spelling variant. This table links those forms to their citation forms and base forms. It provides information about agreement between subjects (nouns and pronouns) and verbs and between determiners and nouns.

EUI	The Entry Unique ID Number (4.3.2.1)
STR	String (4.3.1.1)
SCA	Syntactic Category (4.3.2.4)
AGR	Agreement/Inflection Code (4.3.1.2)
CIT	Citation Form (4.3.2.2)
BAS	Base Form (4.3.2.3)

4.4.3.2 - Inflection Type (File = lrtyp)

The lrtyp table has one or more rows for each lexical entry, indicating the inflectional pattern(s) to which it belongs.

EUI	The Entry Unique ID Number (4.3.2.1)
-----	--------------------------------------

BAS	The Base Form (4.3.2.3)
SCA	Syntactic Category (4.3.2.4)
TYP	Inflectional Type (4.3.2.7)

4.4.3.3 - Complementation (File = lrcmp)

In lrcmp there is one line for each complement code for each entry.

EUI	The Entry Unique ID Number (4.3.2.1)
BAS	The Base Form (4.3.2.3)
SCA	Syntactic Category (4.3.2.4)
COM	Complement Code. (4.3.2.6)

4.4.3.4 - Pronouns (File = lrprn)

lrprn has one or more rows for each pronoun entry in the lexicon. Each row has nine columns.

EUI	The Entry Unique ID Number (4.3.2.1)
BAS	The Base Form (4.3.2.3)
AGR	Agreement/Inflection Code (4.3.1.2)

See Section 14.1 in "The SPECIALIST Lexicon".

The agreement/inflection field in lrprn indicates person and number for anaphoric reference, AGR in lragr indicates person for agreement. These differ in the case of possessive nominal pronouns. The possessive nominal "mine" is "third" for purposes of subject verb agreement and "fst_sing" in its anaphoric reference.

GND	Gender (4.3.1.6)
CAS	Case (4.3.1.3)

POS	Possession (4.3.2.8)
QNT	Quantification (4.3.2.9)
FEA	Other Features (for pronouns) (4.3.2.10)

4.4.3.5 Modifiers (file = lrmod)

The modifier table includes position information for adjectives and modification type information for adverbs, and a variety of features.

EUI	The Entry Unique ID Number (4.3.2.1)
BAS	The Base Form (4.3.2.3)
SCA	Syntactic Category (4.3.2.4)

All the entries represented in this table have the category "adj" or "adv" indicating adjectives or adverbs respectively.

PSN/MOD

The fourth field of lrmod may be one of the following depending on whether the term is an adjective or adverb.

PSN	Position (4.3.2.11) - for adjectives
MOD	Modification Types (4.3.2.12) - for adverbs
FEA	Features (4.3.2.10)

4.4.3.6 - Properties (file = lrprp)

lrprp indicates properties of terms in various categories.

EUI	The Entry Unique ID Number (4.3.2.1)
BAS	The Base Form (4.3.2.3)

SCA Syntactic Category (4.3.2.4)

STR String (4.3.1.1)

STR is only indicated in lrprp when a feature applies to a single string out of those generated by the entry, as in the negative contractions.

FEA Features (4.3.2.10)

4.4.3.7 - Abbreviations and Acronyms (file = lrabr)

This file links acronyms and abbreviations to their expansions.

EUI The Entry Unique ID Number (4.3.2.1)

This field contains the EUI of the acronym or abbreviation.

BAS The Base Form (4.3.2.3)

This field contains the Base form of the acronym or abbreviation.

ABR Acronym or Abbreviation (4.3.3.1)

BAS The Base Form (4.3.2.3)

This field contains the Base form of the expansion of the acronym or abbreviation.

EUI The Entry Unique ID Number (4.3.2.1)

This field contains the EUI of the expansion of the abbreviation or acronym.

4.4.3.8 - Spelling Variants (lrsp)

EUI The Entry Unique ID Number (4.3.2.1)

SPV Spelling Variant (4.3.3.2)

BAS The Base Form (4.3.2.3)

4.4.3.9 - Nominalizations (file =lrnom)

This field contains the EUI of the nominalization.

BAS The Base Form (4.3.2.3)

This field contains the base form of the nominalization.

SCA Syntactic Category (4.3.2.4)

This field contains the category of the nominalization (noun).

EUI The Entry Unique ID Number (4.3.2.1)

This field contains the EUI of a verb or adjective of which the noun is a nominalization.

BAS The Base Form (4.3.2.3)

This field contains the base form of the verb or adjective of which the noun is a nominalization.

SCA Syntactic Category (4.3.2.4)

This field contains the syntactic category (adj or verb) of the adjective or verb.

4.4.3.10 - Trademarks (file = lrtrm)

EUI The Entry Unique ID Number (4.3.2.1)

BAS Base (4.3.2.3)

GEN Generic Term (4.3.2.13)

The appearance of a form in the lrtrm table indicates that it is a trademark. It may or may not have a generic term associated with it.

4.4.3.11 - Files (file = lrfl)

The lrfl table describes each file in the ASCII relational form of the lexicon.

FIL	File Name(s) (4.3.4.5)
DES	Description (4.3.4.2)
FMT	Format (4.3.4.3)
CLS	Number of Columns (4.3.4.7)
RWS	Number of Rows (4.3.4.4)
BTS	Size in Bytes (4.3.4.6)

4.4.3.12 - Word Index. (file = lrwr)

WRD	Word (4.3.4.1)
EUI	The Entry Unique ID Number (4.3.2.1)

4.4.3.13 - Fields (file = lrfl)

COL	Three Letter Field Name (4.3.4.8)
DES	Description (4.3.4.2)
REF	Cross Reference to Document (4.3.4.9)
FIL	File Name(s) (4.3.4.5)

4.5 The SPECIALIST Lexicon Unit Record

The unit lexical record is a frame structure consisting of slots and fillers. Each lexical record has a base= slot whose filler indicates the base form, and optionally a set of spelling_variants= slots to indicate spelling variants. Lexical entries are delimited by entry= slots filled by the EUI number of the entry. EUI numbers are seven digit numbers preceded by an "E". Each entry has a cat= slot indicating part of speech. The lexical record is delimited by braces ({...}).

The unit lexical records for "anaesthetic" given below illustrate some of the features of a SPECIALIST unit lexical record:

```
{base=anesthetic
spelling_variant=anaesthetic
entry=E0330018
    cat=noun
    variants=reg
    variants=uncount
}
{base=anesthetic
spelling_variant=anaesthetic
entry=E0330019
    cat=adj
    variants=inv
    position=attrib(3)
    position=pred
    stative
}
```

The base form "anesthetic" and its spelling variant "anaesthetic" appear in two lexical records containing a noun and a verb entry. The variants= slot contains a code indicating the inflectional morphology of the entry; the filler reg in the noun entry indicates that the noun "anaesthetic" is a count noun which undergoes regular English plural formation ("anaesthetics"); inv in the variants= slot of the adjective entry indicates that the adjective "anesthetic" does not form a comparative or superlative. The position= slot indicates that the adjective "anaesthetic" is attributive and appears after color adjectives in the normal adjective order.

The SPECIALIST Technical report "The SPECIALIST Lexicon" gives a full description of the lexicon in unit format.

4.6 Lexical Databases

4.6.0 Introduction

The lexical databases contain lexical information that we have found to be useful for Natural Language Processing. They are not finished products but are under continuous development.

4.6.1 Semantically Related Terms SM.DB

This database (SM.DB) contains pairs of semantically related terms. Each row of the database has the following form.

```
TERM1|SCA1|TERM2|SCA2
```

Such a row indicates that TERM1 in syntactic category SCA1 is semantically related to TERM2 in syntactic category SCA2. Both terms are given in base form.

Examples:

```
alar|adj|wing|noun
ocular|adj|eye|noun
auditory area|noun|auditory cortex|noun
vomitive|noun|emetic|noun
vomitive|adj|emetic|adj
iridescent virus|noun|iridovirus|noun
typhloteritis|noun|cecitis|noun
```

4.6.2 Derivationally Related Terms: DM.DB

This database (DM.DB) contains pairs of terms related by derivational morphology. Each row of the database has the same form as sm.db. Both terms are given in base form.

TERM1|SCA1|TERM2|SCA2

Examples:

abashment | noun | abash | verb
 adenoypophyseal | adj | adenoypophysys | noun
 amenorrhoeic | adj | amenorrhoea | noun
 arithmetician | noun | arithmetic | noun
 convert | verb | conversible | adj
 immobilize | verb | immobility | noun

DM.DB is derived from the morphological fact files (dm.fct, etc.) used in LVG.

4.6.3 Spelling Variants: SP.DB

The Spelling Variant database (SP.DB) contains pairs of terms that are spelling variants of each other. The format of each row is the same as the format of dm.db and sm.db. SCA1 and SCA2 are always the same in SP.DB.

TERM1|SCA1|TERM2|SCA2

Examples:

accouter | verb | accoutre | verb
 accurst | adj | accursed | adj
 acidaemic | adj | acidemic | adj
 aesthetics | noun | esthetics | noun
 dairy farmer | noun | dairy-farmer | noun

SP.DB is derived from the SPECIALIST lexicon.

4.6.4 Neo-classical Combining Forms NC.DB

This database (NC.DB) contains morphemes that are used to form neo-classical compounds. Each row of the database has the following form.

MORPHEME|MEANING|TYPE

Morphemes may have optional connecting vowels indicated in parentheses. The types are: prefix, root, and terminal.

Examples:

abdomin(o) | abdomen | root
 ab | away from | prefix
 acou(o) | hearing | root
 cardi(o) | heart | root
 cele | swelling | terminal
 desis | binding | terminal
 de | negate | prefix

E0051632|quickly|adv|verb_modifier;manner|
 ::::::::::::::
 lrnom.sam
 ::::::::::::::
 E0007121|acuity|noun|E0007127|acute|adj|
 E0021126|deduction|noun|E0021123|deduce|verb|
 E0021126|deduction|noun|E0021124|deduct|verb|
 E0061851|transportation|noun|E0061850|transport|verb|
 ::::::::::::::
 lrprn.sam
 ::::::::::::::
 E0030918|he|thr_sing|pers(masc)|subj|||
 E0036100|it|thr_sing|neut|subj,obj|||
 E0055585|she|thr_sing|pers(fem)|subj|||
 ::::::::::::::
 lrprp.sam
 ::::::::::::::
 E0007127|acute|acute|adj|stative|
 E0004825|Parkinson|Parkinson|noun|proper|
 E0014877|can|can't|modal|negative|
 E0014877|can|can't|modal|negative|
 E0014877|can|couldn't|modal|negative|
 ::::::::::::::
 lrspl.sam
 ::::::::::::::
 E0017902|colour|color|
 E0017903|colour|color|
 E0008769|anesthetic|anaesthetic|
 E0008770|anesthetic|anaesthetic|
 ::::::::::::::
 lrtrm.sam
 ::::::::::::::
 E0412633|Actinex|meso-nordihydroguaiaretic acid|
 E0415286|Antivert||
 E0414928|thioplex|thiotepa|
 E0415019|theo-hexanicit||
 ::::::::::::::
 lrtyp.sam
 ::::::::::::::
 E0007127|acute|adj|inv;periph|
 E0014875|can|noun|reg|
 E0014876|can|verb|regd|
 E0014937|canine tooth|noun|irreg(canine teeth)|
 E0017902|color|noun|reg|
 E0017902|color|noun|uncount|
 E0017903|color|verb|reg|
 E0051632|quickly|adv|inv;periph|
 ::::::::::::::
 lrwd.sam
 ::::::::::::::
 acute|E0001203
 acute|E0007127
 acute|E0007130
 acute|E0007131
 acute|E0007132
 acute|E0007133

acute|E0007134
acute|E0007135
acute|E0007136
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acute|E0007210
acute|E0007211
acute|E0007212
acute|E0007213
acute|E0007214
acute|E0007215
acute|E0016430
acute|E0018044
acute|E0019256
acute|E0200089
acute|E0200090
acute|E0203254
acute|E0208423
acute|E0208433
acute|E0208452
acute|E0208475
acute|E0208494
acute|E0210443
acute|E0210574
acute|E0210575
acute|E0210576
acute|E0210642
acute|E0214476
acute|E0216615
acute|E0216616
acute|E0217176
acute|E0217376
acute|E0217551
acute|E0217756
acute|E0313307
acute|E0314926
acute|E0319558
acute|E0321232
acute|E0321304
acute|E0322005
acute|E0332592

acute|E0409630
acute|E0418090
acute|E0418484
acute|E0418485
acute|E0418705
acute|E0420121
acute|E0422597
acute|E0422634
acute|E0422824
acute|E0422825
can|E0014875
can|E0014876
can|E0014877
can|E0014875
can|E0014876
can|E0014877

4.8 Lexical Programs

The lexical variant generation package consists of three primary programs -- a normalizer, a word index generator, and a lexical variant generator, together with a set of ancillary programs for normalization.

This package is implemented in Java (V1.2). Updates and bug fixes to this versions may be found at the url: <http://umlslex/>.

The distributions come with install programs (for Solaris, Linux, and Window) and a ReadMe.txt file describing how to install and configure the lexical programs and providing a brief description of each program.

The **docs** directory contains user guides, Java API documents, and design documents describing in detail the use of Lexical tools. This document is a general introduction to the programs in the lexical variant generation package for the 2003 version.

The compressed lexical programs are as follows:

lvg2002.tar.gz

- The official 2003 distribution of LVG. This includes the source code for the programs, the data and tables in a pure Java embedded database (Instant DB) the programs use, full documentation, installation instructions, and jar files of the programs. See the documents contained within this distribution for a more complete description of this product.

lvg2002.basic.tar.gz

- The simplified 2003 version of LVG. This includes the source code for the programs, the data the programs use, full documentation, installation instructions, and jar files of the programs. See the documents contained within this distribution for a more complete description of this product.

Normalization (norm)

The lexical program **norm** generates the normalized strings that are used in the normalized string index, MRXNS. Thus norm must be used before MRXNS can be searched.

The normalization process involves stripping possessives, replacing punctuation with spaces, removing stop words, lower-casing each word, breaking a string into its constituent words, and sorting the words in alphabetic order. The uninflected forms are generated using the SPECIALIST lexicon if words appear in the lexicon, otherwise they are generated algorithmically. When a form could be an inflection of more than one base form, the new normalization process returns multiple uninflected forms. If a string to be normalized contains multiple ambiguous forms, and the permutation of these ambiguous forms offer more than 10 output forms, the input form

lowercased, with punctuation replaced, word order sorted, but not uninflected, is returned. The upper limit of permutation number (10) is configurable by modifying the configuration file. The program **luiNorm** has the behavior of prior year's normalization, and is distributed for those who need it.

Norm reads its standard input and writes to standard output. It expects input lines to be records separated into fields. The field separator is |. The string to be normalized is identified to norm using the **-t** option. **-t** takes a numerical argument which denotes the field in which the input string is to be found. If no **-t** option appears, norm assumes that the input string is in the first field (**-t:1**). There need not be more than one field, so lines consisting only of input strings are properly understood.

Norm output records include all the fields of the input record with an additional field to the right containing the normalized form of the input string.

For example, if the user had a list of terms to be looked up via the normalized string index in a file called **terms**, he or she could use **norm -i:terms -o:terms.nrm** to get the normalized form of each term. If the input file **terms** contained the following:

```
2, 4-Dichlorophenoxyacetic acid
Syndrome, anterior, compartment
Abnormal, weight, gain
Anemia, Refractory, with Excess of Blasts
left atriums
```

the file **term.nrm** would contain:

```
2, 4-Dichlorophenoxyacetic acid|2 4 acid dichlorophenoxyacetic
Syndrome, anterior, compartment|anterior compartment syndrome
Abnormal, weight, gain|abnormal gain weight
Anemia, Refractory, with Excess of Blasts|anemia blast excess refractory
left atriums|atrium left
left atriums|atrium leave
```

The string in the second field of each line of **terms.nrm** is now suitable for matching to MRXNS.

Word Index (wordInd)

The lexical program **wordInd** breaks strings into words for use with the word index in MRXW. Users of the word index should use **wordInd** to break strings into words before searching in the word index. This assures congruence between the words to be looked up and the word index.

Word for this purpose is defined as a token containing only alphanumeric characters with length one or greater. The **wordInd** program lowercases the output words.

The **wordInd** program reads its standard input and writes to its standard output. Like **norm** and **lvg**, it expects each input line to be a record separated into fields by |. The field containing the input string is identified using the **-t** option. The numerical argument of **-t** denotes the field in which the input string may be found. If no **-t** option is given, the input string is expected to be in the first field (**-t:1**). There need not be more than one field, so lines consisting only of input strings are properly understood.

The **wordInd** program outputs one line of output for each word found in the input string. Input fields are not repeated in the output unless specified in a **-F** option. Applying **wordInd** to the input string **Heart Disease, Acute** would result in three output lines:

```
heart
disease
acute
```

The numerical argument of **-F** indicates an input field to be repeated in the output. A numerical argument for **-F** option is required for

each input field that is to be repeated. Fields are repeated in the order in which the numerical argument of **-F** options appear. The output words always appear as an additional field to the right of any repeated input fields. For example, applying **wordInd -t:2 -F:2:1** to a record of the form **UI23456|tooth, canine|definition.....;** would result in the following output:

```
tooth, canine|UI23456|tooth
tooth, canine|UI23456|canine
```

The third field of each of those records contains a word extracted from the input term in the first field (**-t:2**, **-F:2**). The **-F:1** option repeats the UI numbers from the first field of input. The fact that **-F:2:1** placed the UI numbers (field 1) after the input string (field 2).

Lexical Variant Generation (lvg)

The lvg program generates lexical variants of input words. It consists of several different flow components that can be combined in various ways to produce lexical variants. The user of lvg chooses combinations of flow components and combines them into a **flow**. (The normalizer program, norm, is essentially the lvg program with a pre-selected flow option: **lvg -f:N**.) The arguments of the **-f** flag are used to specify a flow. Each flow can be thought of as a pipeline with each flow component feeding the next. For example, the flow **-f:i** simply generates inflectional variants and **-f:l:i** generates lowercase inflectional variants. Each of the flow components options is discussed on the documents for lvg.

The lvg program reads from its standard input and writes to its standard output. Input records may be typed in at the keyboard, after typing the command on the command line (**lvg -f:i**) or input lines may be read from a file (**lvg -f:i -i:file**) or piped to lvg from another command (**COMMAND|lvg -f:i**). Output records may be directed to the screen (default), send to a file (**lvg -f:i -i:INFILE -o:OUTFILE**) or piped to another command (**lvg -f:i -i:infile | COMMAND**).

Input

The lvg program is designed to work with one line input records divided into fields. The default field separator is |. The field separator can be changed using the **-s** option. The field in which the input term, whose variants are to be generated, can be specified with the **-t** option. In the absence of a **-t** flag the input term is assumed to be in the first field of the input. So both **dog** and **dog|canine|UI4567** would generate variants of **dog**. With the **-t** flag set to **2**, **dog|canine|UI4567** would generate variants of **canine**. In the case of single field input (**dog**), lvg generates variants from the only field regardless of the setting of **-t**.

The lvg program can read category (part of speech) and inflection information from the input record. The numerical argument to the **-cf** option indicates the field in which category information is located. In the input record, category information needs to be encoded as a number according to the scheme described on the documents for lvg. The numerical argument to the **-if** option indicates the field in which inflection information is located. In the input record, inflection information needs to be encoded as a number according to the scheme described on the documents for Lexical tools.

Output

The lvg program adds five new fields to the input record and outputs a record for each variant generated. For example, if **dog|canine|UI4567** is given to the standard input of **lvg -f:i** the output sent to standard out will be:

```
dog|canine|UI4567|dog|128|1|i|1|
dog|canine|UI4567|dog|128|512|i|1|
dog|canine|UI4567|dogs|128|8|i|1|
dog|canine|UI4567|dog|1024|1|i|1|
dog|canine|UI4567|dog|1024|262144|i|1|
dog|canine|UI4567|dog|1024|1024|i|1|
dog|canine|UI4567|dogs|1024|128|i|1|
dog|canine|UI4567|dogged|1024|64|i|1|
dog|canine|UI4567|dogged|1024|32|i|1|
dog|canine|UI4567|dogging|1024|16|i|1|
```

The first three fields of each record above are identical to the input record, the rest are supplied by lvg. The first additional field is the variant form lvg has generated. The second additional field is the syntactic category of the variant encoded as a number. The third additional field is the inflection of the variant encoded as a number. The fourth additional field indicates the flow that was selected. The fifth field is the number of the flow which generated this variant. Output category (parts of speech) and inflection information are encoded in the same scheme used for input category and inflection information.

For a more detailed technical discussion of lvg, norm, and wordInd see the documents for Lexical tools.

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SECTION 5

USING THE UMLS® KNOWLEDGE SOURCE SERVER VIA THE INTERNET

5.0 Background

The UMLS Knowledge Source Server is an evolving tool for providing Internet access to the information stored in the UMLS Knowledge Sources. The purpose of the Knowledge Source Server is to make the UMLS data more accessible to users, and in particular to systems developers. The system architecture is based on the client server paradigm wherein remote site users send their requests to a centrally managed server at the U.S. National Library of Medicine. The client programs can run on platforms supporting the TCP/IP communication protocol. Access to the system is provided through a command line interface, through an Application Programming Interface (API), and through the World Wide Web (WWW).

5.1 Querying the Knowledge Source Server

5.1.1 Metathesaurus

The Knowledge Source Server allows the user to request information about particular Metathesaurus concepts, including attributes such as the concept's definition, its semantic types, the concepts that are related to it, etc. It also allows the user to request information about the attributes themselves; for example, by asking for all the concepts that have been assigned to a particular semantic type.

Basic concept information includes the Metathesaurus unique identifier of the concept, the preferred name for the concept, and the names and sources of all terms that comprise that concept. Additional concept information often includes a definition and the source of that definition. Semantic type information is also included. Information about the hierarchical contexts of Metathesaurus concepts is readily available in the system. Related concepts are easily found. If a user were interested in information about a particular term within a concept, then the results could be limited in that way. Co-occurrence data are included for MeSH and AI-RHEUM terminology.

An important perspective on the Metathesaurus is source specific data. It is possible to query the server by limiting the query to a particular vocabulary. The user may wish to see the ancestors or descendants for a term in just a particular vocabulary, or the user may wish to see just the synonyms for a particular term in a particular vocabulary.

Attributes may be queried in the system. Thus, all concepts with a particular semantic type, all terms with a particular syntactic category, and all terms from a particular source vocabulary may be found. Searching for all concepts with a particular semantic type will, for example, give the user a good idea of the coverage of the Metathesaurus in a subject domain.

5.1.2 Semantic Network

The Semantic Network contains information about semantic types and their relationships. The implementation of the network module computes the relationships between semantic types using the inheritance property of the network type hierarchy. Information in the Semantic Network can be queried for semantic types and the relationships between them. Individual queries are specified by providing the known types or relations and leaving out the unknowns. The system then retrieves the corresponding values for the unknowns. For

example, if the user wished to know what semantic types are related by a particular relation, then the user would indicate only the relationship name and all the semantic type pairs linked by that relationship would be retrieved. The user might also wish to know if a particular relationship holds between a pair of types.

It is possible to retrieve all the relations between a pair of types. For example, "treats", "prevents", and "complicates" would be listed, among others, as potential relationships between drugs and diseases. It is also possible to retrieve an exhaustive list of all related types in the network. Queries can be made about the definition, unique identifier, tree number, ancestors, parents, children, descendants, and siblings of a semantic type or relation.

5.1.3 SPECIALIST Lexicon

The Knowledge Source Server provides access to lexical records in the SPECIALIST lexicon. The SPECIALIST lexicon is an English language lexicon containing many biomedical terms. The lexicon entry for each word or term records syntactic, morphological, and orthographic information. Lexical entries may be single or multiword terms. Lexical information includes syntactic category, inflectional variation (e.g., singular and plural for nouns, the conjugations of verbs, the positive, comparative, and superlative for adjectives and adverbs), and allowable complementation patterns (i.e., the objects and other arguments that verbs, nouns, and adjectives can take).

5.2 Gaining Access to the UMLS Knowledge Source Server

Access to the UMLS Knowledge Source Server is available to anyone who has signed the UMLS license agreement and received a license number from NLM. The URL for the Knowledge Source Server Web site is <http://umlsks.nlm.nih.gov>. First time users should establish a login and a password through the online registration at the web site. Any questions or problems should be addressed via email to umlsks@nlm.nih.gov.

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SECTION 6

USING THE UMLS® CD-ROMS

6.1 Content of the CD-ROMS

The 2003AC edition of the UMLS Knowledge Sources is available only in compressed formats: Unix (TGZ) and PC (ZIP). Two CD-ROMs are required for each format. To use the UMLS, you must uncompress BOTH discs to a local hard disk, which will then contain the complete distribution including the MetamorphoSys tool to customize your version.

The PC format discs (2003AC_1_ZIP and 2003AC_2_ZIP) contain the UMLS Knowledge Sources in ZIP format, with PC line termination in the ASCII files. Use this format for Windows (version 3.1 and up), Windows NT and 2000 (v4.0 and up), XP, and OS/2. PKZIP or WINZIP programs may be used to extract the data; they may be obtained using these URLs: <http://www.pkware.com> or <http://www.winzip.com>. To extract the files to your disk, assign the target directory in which you wish to create the 2003AC release and unzip the ZIP files on BOTH CD-ROMs. NOTE that your file system must support large file sizes, e.g. NTFS or FAT32.

The Unix format CD-ROMs (2003AC_1_TAR and 2003AC_2_TAR) contain the UMLS Knowledge Sources in tar GNU ZIP (gzip) format (.tar.gz), with Unix line termination in the ASCII files. Use this format for operating systems that support UNIX line termination (all flavors of UNIX and Linux). To unpack this you will need the free gzip (or gunzip) utility available from <http://www.gnu.org>. 'cd' to the target directory for 2003AC, then type the following commands:

```
gzip -dc [cdrom_path]/2003AC_1.TAR | tar xvf -
```

and then

```
gzip -dc [cdrom_path]/2003AC_2.TAR | tar xvf -
```

where [cdrom_path] is the path to the TAR file on your CD-ROM.

NOTE that if you do not include the pipe to tar, the extraction will fail when the intermediate file exceeds most Unix file system's 2 GB size limits on single files. Appropriate Java Runtime Environments (jre) for MetamorphoSys are included for each format.

All users should extract the full 2003AC UMLS Knowledge Sources to hard disk, creating the Standard 2003AC Directory Structure below which occupies 4.2 GB. We recommend a minimum of 8 GB available disk space.

PLEASE NOTE that you must have the full 2003AC UMLS Knowledge Sources on a local hard disk to use MetamorphoSys; you will need MetamorphoSys to comply with the license agreement and to customize the Metathesaurus to meet your needs.

Standard 2003AC UMLS Knowledge Source Directory Structure

2003AC/	root UMLS directory
DOC/	UMLS Knowledge Source documentation (this manual) in ASCII, PDF, and HTML.
META/	Metathesaurus concepts in ASCII relational format
CHANGE/	Files identifying significant differences from the previous edition.
METAMSYS/	MetamorphoSys system
METASUBSET/	Your customized Metathesaurus (initially empty)
NET/ in ASCII format.	Semantic Network in ASCII relational format and unit record formats; and Semantic Network documentation in ASCII format.
LEX/ ASCII format.	SPECIALIST lexicon in ASCII relational and unit record formats and SPECIALIST documentation in ASCII format.
DOCS/	SPECIALIST Documentation
LEX_DB/	
LEX_PGMS/	SPECIALIST lexicon related lexical programs in executable and C source code.
MISC/	

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License Agreement for Use of UMLS® Products

APPENDIX A

LICENSE AGREEMENT FOR USE OF THE UMLS® PRODUCTS

The License Agreement for 2003 is available with the 2003AC Documentation: ([license.html](#)) and on the NLM website: (<http://www.nlm.nih.gov/umls/>).

nlm.nih.gov/research/umls/license.html). NLM does not charge for the UMLS Knowledge Sources. Users of the UMLS Metathesaurus may have to enter into separate license arrangements (See Appendix A.1), which may involve charges, with the copyright holders of some of the individual vocabularies that have been incorporated in the UMLS Metathesaurus.

Send questions, comments about the UMLS project to: custserv@nlm.nih.gov or call 1-888-FINDNLM.

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APPENDIX A.1

Appendix to the License Agreement for Use of the UMLS® Knowledge Sources

UMLS METATHESAURUS® SOURCE VOCABULARIES -- November 2003AC Edition

Sources are listed in order according to the abbreviations used in the UMLS Metathesaurus files. If additional restrictions and notices apply, the category of restrictions and the special notices appear under the name of the source. See the license agreement for an explanation of the categories of restrictions. Many sources publish printed editions and/or other explanatory information that may be essential to understanding the purpose and application of particular sources in data creation and retrieval. Contact information is provided for each source. Please address questions about permissions or license agreements for additional uses not covered by this Agreement, or other inquiries about individual sources, to the appropriate contacts.

NLM is working toward inclusion in the UMLS Metathesaurus of the complete, current edition of most of these vocabulary sources.

AIR93 AI/RHEUM. Bethesda, (MD): National Library of Medicine, Lister Hill Center, 1993.

Contact: May Cheh, Lister Hill Center, NLM; e-mail: cheh@nlm.nih.gov

ALT2003 Alternative Billing Concepts (AltLink). Albuquerque (NM): Alternative Link LLC, 2003.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Alternative Link LLC; 6121 Indian School Road NE, Suite 131; Albuquerque, NM 87110; phone: 877-621-5465; <http://www.alternativelink.com>; e-mail: mail@alternativelink.com

AOD2000 Alcohol and Other Drug Thesaurus: A Guide to Concepts and Terminology in Substance Abuse and Addiction. 3rd ed. [4 volumes]. Bethesda (MD): National Institute on Alcohol Abuse and Alcoholism (NIAAA) and Center for Substance Abuse Prevention (CSAP), 2000.

Contact: Nancy Winstanley; NIAAA Library; 2107 Wilson Blvd, Suite 1000; Arlington, VA 22201; phone: 703-741-7147; e-mail: nwinstanley@csrincorporated.com

BI98 Beth Israel OMR Clinical Problem List Vocabulary. Version 1.0. Boston (MA): Beth Israel Deaconess Medical Center, 1999.

CATEGORY 2 RESTRICTIONS APPLY

Contact: Daniel Sands, M.D.; Center for Clinical Computing, Beth Israel Deaconess Medical Center, Harvard University; 330 Brookline Avenue; Boston, MA 02215; phone: 617-667-1510; e-mail: dsands@bidmc.Harvard.edu

BRMP2003 Descritores em Ciencias da Saude [Portuguese translation of MeSH]. Sao Paulo (Brazil): Latin American and Caribbean Center on Health Sciences Information. BIREME/PAHO/WHO, 2003.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Elenice de Castro; e-mail: elenice@brm.bireme.br

BRMS2003 Descriptores en Ciencias de la Salud [Spanish translation of MeSH]. Sao Paulo (Brazil): Latin American and Caribbean Center on Health Sciences Information. BIREME/PAHO/WHO, 2003.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Elenice de Castro; e-mail: elenice@brm.bireme.br

CCPSS99 Canonical Clinical Problem Statement System (CCPSS). Version 1.0. Nashville (TN): Department of Biomedical Informatics, Vanderbilt University, 1999.

CATEGORY 3 RESTRICTIONS APPLY

Permission will be freely given for any uses and applications containing CCPSS which are not for sale - i.e. those used internally or given to others without charge.

Contact: Steven Brown, MD., Department of Biomedical Informatics, Vanderbilt University Medical Center; 2209 Garland Ave; Nashville, TN 37232-8340; phone: (615)321-6335; e-mail: sbrown@vumclib.mc.vanderbilt.edu

CCS2003 Clinical Classifications Software (CCS) Categories. February 2003 release. Rockville (MD): Agency for Health Care Policy and Research (AHCPR), 2003.

Contact: phone: Anne Elixhauser; Agency for Healthcare Research and Quality; 540 Gaither Road; Rockville, MD 20850; phone: 1-800-358-9295; <http://www.ahcpr.gov/data/hcup/ccsfact.htm>

CDT4 Current Dental Terminology (CDT) contained in the HCFA Common Procedure Coding System (HCPCS). Version 4. Washington (DC): Health Care Financing Administration, 2002.

CATEGORY 3 RESTRICTIONS APPLY

For CDT the following special notice must be displayed:
"For CDT only, copyright 2002 American Dental Association, all rights reserved."

Contact for CDT: Mary Essling, American Dental Association; 211 E. Chicago Avenue; Chicago, IL 60611; phone: (312)440-2520

COSTAR_89-95 Computer Stored Ambulatory Records (COSTAR). Boston (MA): Massachusetts General Hospital, 1995, 1993, 1992, 1989.

The UMLS Metathesaurus includes terms that were used frequently at 3 COSTAR sites in the years indicated and supplied to NLM by Massachusetts General Hospital.

Contact: G.Octo Barnett, M.D., Laboratory of Computer Science, Massachusetts General Hospital; 50 Staniford Street, 5th floor; Boston, MA 02114; phone: 617-726-3939; e-mail: Barnett.Octo@mgh.harvard.edu

CPM2003 Columbia Presbyterian Medical Center Medical Entities Dictionary (MED). New York (NY): Columbia Presbyterian Medical Center, 2003.

The UMLS Metathesaurus includes a relatively small number of terms created at Columbia Presbyterian Medical Center for the MED, which also includes terms obtained from the UMLS Metathesaurus and other sources.

CATEGORY 2 RESTRICTIONS APPLY.

Contact: James Cimino, M.D.; Department of Medical Informatics, Vanderbilt Clinic, Columbia University; 622 W. 168th Street; New York, NY 10032; phone: 212-305-8127; e-mail: jjc7@columbia.edu;

CPT01SP Physicians' Current Procedural Terminology (CPT), Spanish translation. 4th ed. Chicago (IL): American Medical Association, 2001.

CATEGORY 3 RESTRICTIONS APPLY.

Contact: Matt Menning, CPT Intellectual Property Services Department, American Medical Association, 515 N. State Street, Chicago, IL 60610; fax: (312) 464-5022; e-mail: Matt_Menning@ama-assn.org; <http://www.ama-assn.org>

CPT2003 Physicians' Current Procedural Terminology (CPT™). 4th ed. Chicago (IL): American Medical Association, 2003.

CATEGORY 3 RESTRICTIONS APPLY.

The following special notice must be displayed:

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Contact: Matt Menning, CPT Intellectual Property Services Department, American Medical Association, 515 N. State Street, Chicago, IL 60610; (312) 464-5022; e-mail:Matt_Menning@ama-assn.org; <http://www.ama-assn.org>

CSP2003 Computer Retrieval of Information on Scientific Projects (CRISP). Bethesda (MD): National Institutes of Health, Division of Research Grants, Research Documentation Section, 2003.

Contact: Dorette Finch; Division of Research Documentation, ORA, OER, National Institutes of Health; 6701 Rockledge Drive; Bethesda, MD 20892-7983

CST95 Coding Symbols for Thesaurus of Adverse Reaction Terms (COSTART) . Rockville (MD): Food and Drug Administration, Center for Drug Evaluation and Research, 1995.

COSTART has been superseded by the Medical Dictionary for Regulatory Activities (MedDRA) Terminology.

DDB00 Diseases Database 2000. London (England): Medical Object Oriented Software Enterprises Ltd., 2000.

CATEGORY 3 RESTRICTIONS APPLY.

Contact: Malcolm Duncan; Medical Object Oriented Software Enterprises Ltd; Unit 36c Marryat Square; Fulham, London SW6 6UA; United Kingdom; phone: +44 020 7381 4220; <http://www.diseasesdatabase.com/>

DMD2003 German translation of the MeSH. Cologne (Germany): Deutsches Institut fuer Medizinische Dokumentation und Information, 2003.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Dr. Elisabeth Berg-Schorn; phone: 49-221-472-4252; e-mail: helpdesk@dimdi.de; <http://www.dimdi.de>

DMDICD10_1995 Internationale Klassifikation der Krankheiten 10 [German translation of ICD10]. Cologne (Germany): Deutsches Institut fuer Medizinische Dokumentation und Information, 2000.

CATEGORY 1 RESTRICTIONS APPLY

Contact: Dr. Michael Schopen; phone: 49-221-472-4252; e-mail: schopen@dimdi.de; <http://www.dimdi.de>

DMDUMD_1996 Die Nomenklatur fuer Medizinprodukte UMDNS [German translation of UMDNS]. Cologne (Germany): Deutsches Insitut fuer Medizinische Dokumentation und Information, 2000.

CATEGORY 1 RESTRICTIONS APPLY

Contact: Dr. Michael Schopen; phone: 49-221-472-4252; e-mail: schopen@dimdi.de; <http://www.dimdi.de>

DSM3R_1987 Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R). 3rd ed. rev. Washington (DC): American Psychiatric Association, 1987.

CATEGORY 3 RESTRICTIONS APPLY

Contact: see entry for DSM4

DSM4_1994 Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). Washington (DC): American Psychiatric Association, 1994.

CATEGORY 3 RESTRICTIONS APPLY

The APA usually charges small administrative fees for copyright permissions, but these may be waived for research purposes. All users should apply for permission in writing or by email to:

Contact: Customer Service, American Psychiatric Press, Inc. 1400 K Street, N.W. Washington, DC 20005; e-mail: csdept@appi.org; <http://www.appi.org>

DUT2003 Nederlandse vertaling van Mesh (Dutch translation of MeSH). Amsterdam, The Netherlands: Nederlands Tijdschrift voor Geneeskunde (Dutch Journal of Medicine), 2003.

CATEGORY 3 RESTRICTIONS APPLY

Contact: A.J.P.M.Overbeke, Nederlands Tijdschrift voor Geneeskunde (Dutch Journal of Medicine), P.O.Box 75971, 1070 AZ Amsterdam, The Netherlands; e-mail: overveke@ntvg.nl; <http://www.ntvg.nl>

DXP94 DXplain (An expert diagnosis program). Boston (MA): Massachusetts General Hospital.

Contact: G.Octo Barnett, M.D., Laboratory of Computer Science, Massachusetts General Hospital; 50 Staniford Street, 5th floor; Boston, MA 02114; phone: 617-726-3939; e-mail: Barnett.Octo@mgh.harvard.edu

FIN2003 Finnish translation of MeSH. Helsinki (Finland): Finnish Medical Society Duodecim, 2003.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Peter Nyberg, MD; phone: 09-393-091; e-mail: peter.nyberg@sll.fimnet.fi

GO2002_12_16 Gene Ontology (GO): tool for the unification of biology. The Gene Ontology Consortium, 2000.

Contact: <http://www.geneontology.org/>

HCPT03 HCPCS Version of Current Dental Terminology (CDT). Version 4. Washington (DC): Health Care Financing Administration, 2002.

CATEGORY 3 RESTRICTIONS APPLY

HCPCS03 Health Care Financing Administration (HCFA) Common Procedure Coding System (HCPCS). Washington (DC): Health Care Financing Administration, 2003.

The American Medical Association's CPT™ codes in HCPCS have a Source Abbreviation of HCPT03. The American Dental Association's CDT codes in HCPCS have a Source Abbreviation of HCPT03.

Contact for HCPCS: C. Kaye Riley, Health Care Financing Administration; e-mail: criley@hcfa.gov

HCPT03 HCPCS Version of Current Procedural Terminology (CPT). Washington (DC): Health Care Financing Administration, 2003.

CATEGORY 3 RESTRICTIONS APPLY

HHC2003 Saba, Virginia. Home Health Care Classification of Nursing Diagnoses and Interventions. Washington (DC): Georgetown University, 2003.

CATEGORY 1 RESTRICTIONS APPLY

Contact: Virginia Saba, Ph.D., R.N.; Georgetown University; 2332 South Queen Street; Arlington, VA 22202; phone: 703-521-6132; e-mail: vsaba@worldnet.att.net; <http://www.sabacare.com/>

HL7_1998-2002 Health Level Seven Vocabulary (HL7). Ann Arbor (MI): Health Level Seven, 1998.

Contact: Health Level Seven, 3300 Washtenaw Avenue, Suite 227, Ann Arbor MI 48104-4250; phone: 734-677-7777; e-mail: HQ@HL7.ORG; <http://www.hl7.org>

ICD10_1998, ICD10AE_1998 International Statistical Classification of Diseases and Related Health Problems (ICD-10). Tenth Revision. Geneva (Switzerland): World Health Organization, 1998.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Office of Publications, World Health Organization, 1211 Geneva 27, Switzerland; <http://www.who.int/whosis/icd10>

ICD10AM_2000 International Statistical Classification of Diseases and Related Health Problems. Tenth Revision, Australian Modification; 2nd Edition: January 2000.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Developed and Maintained by the National Centre for Classification in Health, University of Sydney, Faculty of Health Sciences; PO Box 170 Lidcombe, NSW, Australia 1825; Phone: 2 9351 9461

ICD9CM_2004 International Classification of Diseases: 9th revision, Clinical Modification (ICD-9-CM). 6th edition, updated. Washington (DC): Centers for Medicare and Medicaid Services; July 2003.

NLM has generated fully specified titles for ICD-9-CM codes in cases in which the official ICD- 9-CM titles consist of extensions to higher levels in the ICD-9-CM hierarchy. The fully specified names were produced with reasonable care, but have not yet been reviewed and approved by the producers of ICD-9-CM.

Contact: Patricia E. Brooks, pbrooks@cms.hhs.gov; <http://www.cms.hhs.gov/medicare/icd9cm.asp>

ICPC2E_1998, ICPC2AE_1998 International Classification of Primary Care: 2nd ed. electronic form. Classification Committee of the World Organization of National Colleges, Academies, and Academic Associations of General Practitioners/Family Physicians (WONCA), known more briefly as the World Organization of Family Doctors; 1998.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Henk Lamberts (H.Lamberts@AMC.UVA.NL) and Inge Okkes (I.m.okkes@amc.uva.nl)

See reference: Okkes, IM; Jamouille, M; Lamberts, H; Bentzen, N. ICPC-2-E: the electronic version of ICPC-2. Differences from the printed version and the consequences. *Family Practice*; 2000; 17:101-107.

ICPC2P_2000, ICPCPAE_2000 International Classification of Primary Care: Version 2-Plus: Australian Modification; January, 2000.

CATEGORY 3 RESTRICTIONS APPLY

ICPC93 Lamberts, Henk, Wood, Maurice, and Hofmans-Okkes, Inge, editors. International Classification of Primary Care (ICPC) in The European Community (with a multi language layer on a floppy disk). Oxford: Oxford University Press, 1993.

This year, the Metathesaurus has also included translations of ICPC93 in Basque (ICPCBAQ_1993), Danish (ICPCDAN_1993), Dutch (ICPCDUT_1993), Finnish (ICPCFIN_1993), French (ICPCFRE_1993), German (ICPCGER_1993), Hebrew (ICPCHEB_1993), Hungarian (ICPCHUN_1993), Italian (ICPCITA_1993), Norwegian (ICPCNOR_1993), Portuguese (ICPCPOR_1993), Spanish

(ICPCSPA_1993), and Swedish (ICPCSWE_1993).

Contact: Henk Lamberts; e-mail: H.Lamberts@AMC.UVA.NL or Inge Okkes; e-mail: I.m.okkes@AMC.UVA.NL; University of Amsterdam

INS2003 Thesaurus Biomedical Francais/Anglais [French translation of MeSH]. Paris (France): Institut National de la Sante et Recherche Medicale, 2003.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Dr. Annie Advocat; phone: 33-1-44-23-60-70; e-mail: advocat@inserm-dicdoc.u-strasbg.fr; <http://www.inserm.fr>

ITA2003 Italian translation of MeSH. Rome (Italy): Istituto Superiore di Sanita Servizio Documentazione, 2003.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Dr. Adriana Dracos, Viale Regina Elena, 229 00161 Rome Italy; phone: 39-06-49902693; e-mail: dracos@iss.it; <http://www.iss.it>

JABL99 Online Congenital Multiple Anomaly/Mental Retardation Syndromes. Stanley Jablonski. Bethesda (MD): National Library of Medicine, 1999.

CATEGORY 1 RESTRICTIONS APPLY

Contact: Stanley Jablonski, National Library of Medicine, Bethesda MD; e-mail: stanley_jablonski@nlm.nih.gov; http://www.nlm.nih.gov/mesh/jablonski/syndrome_title.html

LCH90 Library of Congress Subject Headings. 12th ed. Washington (DC): Library of Congress, 1989.

There are later editions of this source that are not reflected in the UMLS Metathesaurus. This source has considerable non-biomedical content and will never be included in the Metathesaurus in its entirety.

Contact: <http://www.lcweb.loc.gov>

LNC208 Logical Observations Identifiers, Names, and Codes (LOINC). Version 2.08. Indianapolis (IN): The Regenstrief Institute, 2003.

Contact: <http://www.loinc.org>

MCM92 Haynes, Brian. Glossary of Methodologic Terms for Clinical Epidemiologic Studies of Human Disorders. Hamilton, Ontario

(Canada): McMaster University, 1992.

Contact: R. Brian Haynes, M.D., Ph.D.; Clinical Epidemiology & Biostatistics and Medicine, Faculty of Health Sciences, McMaster University; 1200 Main Street West, Rm 2C10B; Hamilton, Ontario, Canada L8N 3Z5; phone: 905-525-9140; e-mail: bhaynes@mcmaster.ca

MDDB_2003_03 Master Drug DataBase (MDDB). St. Louis (MO): Facts and Comparisons, 2003.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Karen Eckert; Medi-Span; 8425 Woodfield Crossing Blvd., Suite 490; Indianapolis, IN 46240; phone: 800-388-8884; e-mail: ms-support@drugfacts.com; http://www.medi-span.com/products/product_mddb.asp

MDR60 Medical Dictionary for Regulatory Activities Terminology (MedDRA) Version 6.0, March, 2003. International Conference on Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH).

CATEGORY 3 RESTRICTIONS APPLY

Contact: MedDRA MSSO; 12011 Sunset Hills Road; Reston, VA 20190-3285; phone: 877-258-8280; e-mail: MSSOhelp@ngc.com; <http://meddramsso.com>

MDRAE60 Medical Dictionary for Regulatory Activities Terminology (MedDRA), American English Equivalents, Version 6.0, March, 2003. International Conference on Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH).

CATEGORY 3 RESTRICTIONS APPLY

Contact: MedDRA MSSO; 12011 Sunset Hills Road; Reston, VA 20190-3285; phone: 877-258-8280; e-mail: MSSOhelp@ngc.com; <http://meddramsso.com>

MDREA60 Medical Dictionary for Regulatory Activities Terminology (MedDRA), American English, with expanded abbreviations, Version 6.0, March, 2003. International Conference on Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH).

CATEGORY 3 RESTRICTIONS APPLY

Contact: MedDRA MSSO; 12011 Sunset Hills Road; Reston, VA 20190-3285; phone: 877-258-8280; e-mail: MSSOhelp@ngc.com; <http://meddramsso.com>

MDREX60 Medical Dictionary for Regulatory Activities Terminology (MedDRA), with expanded abbreviations, Version 6.0, March, 2003. International Conference on Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH).

CATEGORY 3 RESTRICTIONS APPLY

Contact: MedDRA MSSO; 12011 Sunset Hills Road; Reston, VA 20190-3285; phone: 877-258-8280; e-mail: MSSOhelp@ngc.com; <http://meddramsso.com>

MDRPOR60 Medical Dictionary for Regulatory Activities Terminology (MedDRA), Version 6.0, Portuguese Edition, March 2003. International Conference on Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH).

CATEGORY 3 RESTRICTIONS APPLY

Contact: MedDRA MSSO; 12011 Sunset Hills Road; Reston, VA 20190-3285; phone: 877-258-8280; e-mail: MSSOhelp@ngc.com; <http://meddramsso.com>

MDRSPA60rev Medical Dictionary for Regulatory Activities Terminology (MedDRA), Version 6.0, Spanish Edition, June 2003. International Conference on Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH).

CATEGORY 3 RESTRICTIONS APPLY

Contact: MedDRA MSSO; 12011 Sunset Hills Road; Reston, VA 20190-3285; phone: 877-258-8280; e-mail: MSSOhelp@ngc.com; <http://meddramsso.com>

MIM93 Victor A. McKusick, ed. Online Mendelian Inheritance in Man (OMIM). Baltimore (MD): Johns Hopkins University, 1994.

To date the UMLS Metathesaurus contains a relatively small amount of data from this source.

CATEGORY 1 RESTRICTIONS APPLY

Contact: OMIM, McKusick-Nathans Institute of Genetic Medicine; Johns Hopkins Hospital, Blalock 1007; 600 N. Wolfe St.; Baltimore, MD 21287-4922; phone: 410-955-0313; e-mail: techlicense@jhmi.edu; <http://www.ncbi.nlm.nih.gov/Omim/>

MMSL_2003_03 Multum Drug Source Lexicon. Denver (CO): Multum Information Services, Inc., July 2003.

CATEGORY 1 RESTRICTIONS APPLY

Contact: Multum Drug Source Lexicon; 3200 Cherry Creek South Drive, Suite 300; Denver, CO 80209; phone: 1-800-9-MULTUM; <http://www.multum.com/Lexicon.htm>

MMX01 Micromedex DRUGDEX. Englewood (CO): Micromedex, 2001.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Micromedex, 6200 South Syracuse Way, Suite 300, Englewood CO 80111-4740; phone: (800) 525-9083; e-mail: info@mdx.

com; <http://www.micromedex.com>

MSH2004_2003_08_08 Medical Subject Headings (MeSH). Bethesda (MD): National Library of Medicine, August 8, 2003.

This source has been translated into many languages. To date, eight of the translations have been incorporated into the UMLS Metathesaurus.

Contact: Stuart Nelson, M.D., Head, MeSH Section; e-mail: nelson@nlm.nih.gov; <http://www.nlm.nih.gov/mesh>

MTH UMLS Metathesaurus. Bethesda (MD): National Library of Medicine.

Concept names with this source abbreviation were created by NLM to facilitate creation of the UMLS Metathesaurus. There are relatively few of them.

Contact: William T. Hole, M.D., Lister Hill Center, NLM; e-mail: wth@nlm.nih.gov

MTHCH03 UMLS Metathesaurus Hierarchical CPT terms. Bethesda (MD): National Library of Medicine.

Concept names with this source abbreviation were created by NLM to provide contextual information for CPT™.

CATEGORY 3 RESTRICTIONS APPLY

Contact: William T. Hole, M.D., Lister Hill Center, NLM; e-mail: wth@nlm.nih.gov

MTHFDA_2003_01 FDA National Drug Code Directory (MTHFDA). Rockville (MD): U.S. Food and Drug Administration, Center for Drug Evaluation and Research, 2003.

Contact: <http://www.fda.gov/cder/ndc/index.htm>

MTHHH03 Metathesaurus Hierarchical HCPCS Terms (These terms were created by the NLM to provide contextual information for HCPCS). Bethesda (MD): National Library of Medicine.

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Contact: William T. Hole, M.D., Lister Hill Center, NLM; e-mail: wth@nlm.nih.gov

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Contact: William T. Hole, M.D., Lister Hill Center, NLM; e-mail: wth@nlm.nih.gov

MTHMST2001 Metathesaurus Version of Minimal Standard Terminology Digestive Endoscopy: International Edition April 22, 1998.

Contact: Michele Tringali, tringali.michele@aoud.sanita.fvg.it

MTHMSTFRE_2001 Metathesaurus Version of Minimal Standard Terminology Digestive Endoscopy: French Edition April 22, 1998.

*NOTE: Now a CATEGORY 0

Contact: Michele Tringali, tringali.michele@aoud.sanita.fvg.it

MTHMSTITA_2001 Metathesaurus Version of Minimal Standard Terminology Digestive Endoscopy: Italian Edition April 22, 1998.

*NOTE: Now a CATEGORY 0

Contact: Michele Tringali, tringali.michele@aoud.sanita.fvg.it

NAN99 Carroll-Johnson, Rose Mary, editor. Classification of Nursing Diagnoses. Proceedings of the 10th conference, North American Diagnosis Association. Philadelphia (PA): Lippincott, 1999.

CATEGORY 3 RESTRICTIONS APPLY to commercial use.

Contact: NANDA, 1211 Locust St, Philadelphia, PA 19107; phone: (800)647-9002

NCBI2003 NCBI Taxonomy, Bethesda (MD): National Center for Biotechnology Information, 2003.

Contact: NCBI Taxonomy; National Center for Biotechnology Information, National Library of Medicine, Bldg. 38A; 8600 Rockville Pike; Bethesda, MD 20894; phone: 301-496-2475; e-mail: info@ncbi.nlm.nih.gov; www.ncbi.nlm.nih.gov/Taxonomy

NCI2001a NCI Thesaurus. Version 3.0. Bethesda (MD): National Cancer Institute, National Institutes of Health, July 2001.

Contact: Sherri de Coronado; NCI Center for Bioinformatics; 6116 Executive Blvd, Room 2026; Rockville, MD 20892; e-mail: decorons@exchange.nih.gov; <http://cancer.gov/cancerinfo/terminologyresources>

NDDF01 National Drug Data File. San Bruno (CA): First DataBank Inc., June 2001.

CATEGORY 3 RESTRICTIONS APPLY.

Contact: http://www.firstdatabank.com/knowledge_bases/nddf_plus

NEU99 Bowden, Douglas M., Martin, Richard F., Dubach, Jov G. Neuronames Brain Hierarchy. Seattle (WA): University of Washington, Primate Information Center, 1999.

CATEGORY 3 RESTRICTIONS APPLY.

Contact: Douglas M. Bowden, M.D., Regional Primate Research Center, University of Washington, Box 357330, Seattle, WA 98195; e-mail: dmbowden@u.washington.edu; <http://rprcsgi.rprc.washington.edu/neuronames/index.html>

NIC99 McCloskey, Joanne C.; Bulechek, Gloria M., editors. Nursing interventions classification (NIC): Iowa intervention project. St. Louis (MO): Mosby Year Book, 1999.

CATEGORY 3 RESTRICTIONS APPLY.

Contact: <http://www.nursing.uiowa.edu/centers/cncce/cnccontact.htm>

NOC97 Johnson, Marion; Maas, Meridean, editors. Nursing Outcomes Classification (NOC): Iowa outcomes project. St. Louis (MO): Mosby Year Book, 1997.

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Contact: <http://www.nursing.uiowa.edu/centers/cncce/cnccontact.htm>

OMS94 Martin, Karen S., Scheet, Nancy J. The Omaha System: Applications for Community Health Nursing. Philadelphia (PA): W. B. Saunders, 1992. (with 1994 corrections)

CATEGORY 1 RESTRICTIONS APPLY.

Contact: Karen S. Martin, RN, MSN, FAAN, 2115 South 130th Street, Omaha, Nebraska 68144; fax: (402)333-2091

PCDS97 Ozbolt, Judy Grace. Patient Care Data Set (PCDS). Version 4.0. Nashville (TN): Vanderbilt University School of Nursing, 1998.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Judy Ozbolt, Vanderbilt School of Nursing, 400-C Godchaux Hall, Nashville TN 37240-0008; phone: (615)343-3291; e-mail: judy.ozbolt@mcmail.vanderbilt.edu

PDQ2002 Physician Data Query Online System (PDQ). Bethesda (MD): National Cancer Institute, July 2002.

Contact: Dr. Gisele Sarosy, National Cancer Institute; 6116 Executive Blvd, Room 3001; Bethesda, MD 20892; phone: 301-496-9096;

e-mail: gsarosy@mail.nih.gov; <http://www.nci.nih.gov/cancerinfo/pdq/>

PPAC98 Pharmacy Practice Activity Classification (PPAC). Washington (DC): American Pharmaceutical Association. January, 1998.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Scott Antall, American Pharmaceutical Association - Academy of Pharmaceutical Research and Science; e-mail: ssa@mail.aphanet.org

PSY2001 Thesaurus of Psychological Index Terms. Ninth Edition. Washington (DC): American Psychological Association, 2001.

CATEGORY 3 RESTRICTIONS APPLY.

Contact: PsycINFO Permissions; American Psychological Association; 750 First Street NE; Washington DC 20002-4242; phone: 800-374-2722; e-mail: PsycINFO@APA.org; <http://www.apa.org>

QMR96 Quick Medical Reference (QMR). San Bruno (CA): First Databank, 1997.

Contact: <http://www.firstdatabank.com>

RAM99 Randolph A. Miller Clinically Related Concepts. Nashville (TN): Vanderbilt University, 1999.

Contact: Randy Miller, M.D; Department of Biomedical Informatics, Vanderbilt University; 436 Eskind Biomedical Library; 2209 Garland Ave; Nashville, TN 37232-8340; e-mail: randolph.a.miller@vanderbilt.edu

RCD99, RCDAE_1999, RCDSA_1999, RCDSY_1999

Clinical Terms Version 3 (Read Codes) (Q199). England: National Health Service Centre for Coding and Classification, March 1999.

CATEGORY 3 RESTRICTIONS APPLY

Contact: NHS Information Authority, Aqueous II; Aston Cross, Rocky Lane, Birmingham B6 5RQ, UK; phone: 0121 333 0420; e-mail: helpdesk3@nhsia.nhs.uk; <http://www.nhsia.nhs.uk/terms/pages/default.asp>

RUS2003 Russian Translation of MeSH. Moscow (Russia): State Central Scientific Medical Library, 2003.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Dr. Vladimir Vyugin; State Central Scientific Medical Library, Nakhimovsky prospekt 49, Moscow, GSP 117418, Russia; e-mail: vld@vyugin.mccme.rssi.ru

RXNORM_03AC RxNorm work done by the National Library of Medicine (NLM), Bethesda (MD), National Library of Medicine, META2003AC release.

This release contains concepts created by the National Library of Medicine which express the meaning of a drug name in a normalized form. These concepts relate the names of orderable medications to a dose form and the components of those medications. For further discussion, see the article at:

<http://umlsinfo.nlm.nih.gov/RxNorm.html>

Contact: Stuart Nelson, M.D., Head, MeSH Section; e-mail: nelson@nlm.nih.gov

SNM2 Cote, Roger A., editor. Systematized nomenclature of medicine. 2nd ed. Skokie (IL): College of American Pathologists, 1979. SNOMED update, 1982. Skokie (IL): College of American Pathologists, 1982.

CATEGORY 3 RESTRICTIONS APPLY

Contact: See entry for SNMI.

SNMI98 Cote, Roger A., editor. Systematized Nomenclature of Human and Veterinary Medicine: SNOMED International. Version 3.5. Northfield (IL): College of American Pathologists; Schaumburg (IL): American Veterinary Medical Association, 1998.

CATEGORY 3 RESTRICTIONS APPLY

Contact: <http://www.snomed.org>

SPN02 Standard Product Nomenclature (SPN). Rockville (MD): U.S. Food and Drug Administration, 2002.

Contact: <http://www.fda.gov/cdrh/prodcode.html>

SRC Entries for UMLS Metathesaurus Source Terminologies. Bethesda (MD): National Library of Medicine.

Contact: William T. Hole, M.D., Lister Hill Center, NLM; e-mail: wth@nlm.nih.gov

ULT93 Bell, Douglas. Ultrasound Structured Attribute Reporting (UltraSTAR). Boston (MA): Brigham & Womens Hospital, 1993.

CATEGORY 3 RESTRICTIONS APPLY

Contact: Robert Greenes, M.D., Ph.D., Brigham & Womens Hospital; e-mail: greenes@harvard.edu

UMD2003 Universal Medical Device Nomenclature System: Product Category Thesaurus. Plymouth Meeting (PA): ECRI, 2003.

CATEGORY 1 RESTRICTIONS APPLY.

Contact: Elizabeth Richardson, Director of Database and Nomenclature Systems, ECRI; e-mail: erichard@ecri.org; <http://www.ecri.org>

UWDA173 University of Washington Digital Anatomist Symbolic Knowledge Base. Rosse Cornelius. Structural Informatics Group, Department of Biological Structure, University of Washington, Seattle, Version 1.7.3, March 2003.

Contact: Jose Mejino, M.D.; e-mail: onard@biostr.washington.edu; <http://sig.biostr.washington.edu/projects/da/>

VANDF03 U.S. Department of Veterans Affairs, Veterans Health Administration National Drug File. Department of Veterans Affairs, Washington, DC. Release Date: March 13, 2003.

*NOTE: Now a CATEGORY 0

Contact: Steven Brown; CPEP Office; 1310 24th Avenue S; Nashville, TN 37215; e-mail: Steven.Brown@msd.va.gov

WHO97 WHO Adverse Drug Reaction Terminology (WHOART). Uppsala (Sweden): WHO Collaborating Centre for International Drug Monitoring, 1997.

CATEGORY 2 RESTRICTIONS APPLY.

The Metathesaurus includes translations of WHO97 in French (WHOFRE_1997), German (WHOGER_1997), Portuguese (WHOPOR_1997), and Spanish (WHOSPA_1997).

Contact: WHO Collaborating Centre for International Drug Monitoring, Stora Target 3, S-753 20 Uppsala, Sweden; fax: +46-18-656080

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APPENDIX B

METATHESAURUS® DATA ELEMENTS

AND SOURCE VOCABULARY INFORMATION

B.0 Introduction

This appendix contains descriptions of the Metathesaurus MR* file columns ([Section B.1.1](#)), Metathesaurus Attribute values ([Section B.1.2](#)), a listing of the vocabularies and classifications that are the sources of concepts and terms in the Metathesaurus with the source abbreviations used in the Metathesaurus data ([Section B.2](#) and [B.2.1](#)), a listing of the number of strings from each source ([Section B.3](#)), a listing of the types of names that appear in the source vocabularies with the type abbreviations used in the Metathesaurus, e.g.,

preferred term, entry term ([Section B.4](#)), the order of precedence of sources and types of concept names used to determine the preferred name in the Metathesaurus ([Section B.5](#)), and a list of all the source specific relationship attributes that are not in the Semantic Network ([Section B.6](#)). Appendix B provides supporting details for [Section 2](#) of the documentation. [Section 2](#) contains many references to this Appendix.

B.1 Metathesaurus Data Elements

B.1.0 Introduction

All data elements in the Metathesaurus are described in this section. The data elements have been divided into Column Descriptions and Attribute Descriptions. The descriptions are arranged alphabetically by data element abbreviation.

The designation "Repeating Element" indicates that the data element may have multiple values for a single concept, term, or string.

B.1.1 Column Descriptions

ATN Attribute name

2 or 3 characters

Found in MRSAT

All attribute names are listed in [Appendix B.1.2](#) with descriptions given of each.

Example:

HAB
RN
CPA

ATNL Attribute name list for a source

Found in MRSAB

Attributes associated with each source is listed, separated by commas. All attribute names are listed in [Appendix B.1.2](#) with descriptions given of each.

Examples: MUI, RN, TH

ATV Attribute value

Variable length alphanumeric string with embedded punctuation

Found in MRSAT

Attribute values are described under the corresponding attribute name in [Section B.1.2](#). Some attribute values can exceed 3,500 characters.

ATX	Associated Expression
-----	-----------------------

Multi-term expression for concept's meaning in a named vocabulary

Found in MRATX

Several different formats of the expression are possible:

a.) <Main Heading>/<Subheading> or

<Main Heading>/<Subheading>/<Subheading> or

b.) Individual Main Headings and/or Main Heading and subheading combinations coordinated by the Boolean operators, (i.e., AND, OR, AND NOT). The vocabulary terms in the expression are included in less than and greater than signs <> to distinguish them from Boolean operators. Parentheses are used as necessary to clarify the meaning of Boolean OR expressions.

Examples:

<Pupil>/<Abnormalities>

<Polyps> AND <Rectal Neoplasms>

(<Rectum> OR <Rectal Diseases>) AND <Pain>

Note: Users' needs for Associated Expressions and more formalized data structure are under review. Please provide feedback if you find them useful and/or have suggestions, since we must justify the cost and effort of further development and maintenance.

An expression consists of multiple terms in one Metathesaurus source vocabulary which best expresses the meaning of a concept. These expressions are constructed of Medical Subject Headings (MeSH); of Library of Congress Subject Headings (LCSH); or of Omaha System terms. Information in this element can be used to construct a MeSH or LCSH search related to the concept represented in the Metathesaurus entry, or to determine the correct relationships between concept/qualifier combinations in the Omaha System and concepts that are narrower than these combinations.

Note that parentheses are used in these expressions to clarify the Boolean expression, and punctuation is used to distinguish the vocabulary terms from the Boolean operators. The punctuation will probably have to be removed before the expressions can be used in a search. Depending on the system being searched, the expression may have to be divided into multiple search statements to achieve the desired search result. In the case of MeSH expressions, it may be necessary to EXPLODE one or more terms in the expression to get the desired search result. In the case of LCSH expressions, some of the subheadings are followed by "etc." indicating that other similar subheadings may be used. Note that the LCSH expressions represent combinations actually used by the Library of Congress in cataloging books. They have been mapped to their closest MeSH equivalents.

AV	Average length
----	----------------

Numeric value

Found in MRCOLS

Describes the average length of data in a column.

BTS Size in bytes

Numeric value

Found in MRFILES

For each MR* file, lists the size in bytes.

CENC Character encoding

Found in MRSAB

Character set for a source as specified by the IANA official names for character assignments

See <http://www.iana.org/assignments/character-sets>

CFR CUI frequency for a source

Numeric value

Found in MRSAB

The number of CUIs associated with a specific source

Example: 10234

CLS Number of columns

Numeric value

Found in MRFILES

For each MR* file, lists the # of columns present.

COA Attributes of co-occurrence relationship

Found in MRCOC

For MED and MBD source only

Subheading data for co-occurring concept. Multiple values separated by commas.

Each value contains the two letter abbreviation of a MeSH subheading applied to first concept when it co-occurs with the second concept or <> (indicating no subheading), followed by the frequency of application of this subheading to first concept when it co-occurs with the second.

The 2-letter abbreviations for subheadings - e.g. AB = "abnormalities" - may be found in the MRSAT "QA" attribute name for the subheading concepts, or in the MeSH documentation, e.g. the MeSH browser at:

<http://www.nlm.nih.gov/mesh/MBrowser.html>

CODE Unique identifier or code for an entry in the source vocabulary

NOTE: Was called SCD in previous releases

Alphanumeric value

Found in MRSAT, MRSO and MRCXT

In cases where there is no native identifier, CODE is a unique identifier generated for the Metathesaurus.

COF Frequency of Co-occurrence

Found in MRCOC

The frequency of co-occurrence is the count of CUI1 with CUI2 co-occurrence. In a single citation, many MeSH headings may have more than one subheading applied.

COT Type of Co-occurrence

Found in MRCOC

Valid values for Type of Co-occurrence:

- L Co-occurrence of primary or main subject headings in citations to the published literature
- LQ second concept occurs as a MeSH topical qualifier of the first in citations to the published literature. Where CUI2 is not present, the count of citations of CUI1 with no MeSH qualifiers is reported.

LQB	second concept is qualified by the first (a MeSH topical qualifier) in citations to the published literature
KP	positive association in Knowledge Base
KN	negative association in Knowledge Base, e.g., a finding that is inconsistent with a disease.
MP	Co-occurrence of modifier and problem within a patient record
PP	Co-occurrence of two problems within a patient record

Note that in some circumstances patient record co-occurrences may be self-referential due to differing views of synonymy or to data anomalies.

CREL Relationship of retired CUI (CUI1) to current CUI (CUI2)

Found in MRCUI

Allowed values:

- DEL - deleted - no related CUI present
- SY - merged - the two CUIs are synonymous
- RN - Narrower - CUI2 is narrower than CUI1
- RB - Broader - CUI2 is broader than CUI1
- RO - Other - CUI2 has other relationship to CUI1

CUI Unique Identifier for Concept

The letter C followed by seven digits

The unique identifier for the Metathesaurus concept to which a term and string are linked. The identifier remains the same across versions of the Metathesaurus irrespective of the term designated as the preferred name of the concept. This facilitates file maintenance and management. In the Metathesaurus distribution formats, all data elements are linked to the concept(s) to which they belong.

Note: See MRCUI for cases where CUIs were retired.

CUI1 Unique Identifier of first concept

Letter C followed by 7 numbers

Found in MRREL, MRCOC, MRCUI, and MERGED.CUI

CUI2 Unique Identifier of second concept

Letter C followed by 7 numbers

Found in MRREL, MRCOC, MRCUI, and MERGED.CUI

CURVER Current version flag

Found in MRSAB

A Y or N flag indicating whether or not a row in MRSAB corresponds to the current version of the named source in a particular release.

CXL Context member label

3 letter abbreviation

Found in MRCXT

Possible values are ANC for ancestor of this concept, CCP for concept, SIB for sibling of this concept, and CHD for child of this concept.

CXN Context number

Number character

Found in MRCXT

It is used to distinguish multiple contexts in the same source with the same String Unique Identifier (SUI). The CXNs are not global but are created as required for each concept. Since some concepts have multiple contexts in the same vocabulary with the same SUI, each distinct context can be retrieved with a CUI-SUI-SAB-CXN key.

CXS String for context member

Alphanumeric value

Found in MRCXT

CXT Context or hierarchy

Repeating element

Found in MRCXT

Contexts, hierarchical or otherwise, for the concept from various Metathesaurus source vocabularies. The contexts are available for display to users as an aid to understanding the scope of concepts and for refinement of search strategies. In most cases, the "descendants" of a concept in one or more hierarchies can be usefully assembled to enhance the search for that concept.

The contexts for the Omaha System (OMS) include qualifiers and may require special handling. In the Omaha System, the same qualifier, e.g., Deficit, may appear as the second level in multiple contexts. Its descendants in each context are uniquely applicable to a specific concept/qualifier combination. It is therefore inappropriate to gather all of its descendants to expand a single search.

CXTY Context type

Found in MRSAB

One or more context type for a source per [Section 2.3.2](#) in the UMLS Documentation.

Examples: FULL, NOSIB, FULL-MULTIPLE

DEF Definition

Repeating element

Found in MRDEF

Two subelements

1. Abbreviation of the source of the definition (see [Section B.2](#) for valid values)
2. Variable length string with alpha characters, punctuation, and in some cases numerics

Narrative description(s) of the meaning of the concept. The majority of the definitions come from MeSH, but there are also definitions from a number of other sources. The definitions created specifically for the Metathesaurus have a source value of MTH. Definitions were created specifically for the Metathesaurus only when needed to distinguish among different meanings of the same string. Note that some definitions may be several thousand characters long and tab characters are used to indicate line structure within a few definitions. See also [SOS](#) Scope Statement.

DES Descriptive name

Alphabetic value with embedded punctuation

Found in MRFILES and MRCOLS

DTY SQL-92 data type

Alphanumeric value

Found in MRCOLS

SQL-92 data type for this column.

FIL Physical FILENAME

Alphabetic value

Found in MRFILES and MRCOLS

Valid values are the MR* file names.

FMT List of Columns

Alphabetic value

Found in MRFILES

It is a comma separated list of all the columns in a file in order.

FR Frequency count of number of occurrences of a concept in the information source

Numeric value

Found in MRLO

Optional field.

HCD Hierarchical number or code of context member

Alphanumeric value

Found in MRCXT

Optional field.

IMETA Metathesaurus insert version

Found in MRSAB

The version of the Metathesaurus that a versioned source first appears.

Example: 2001AB

ISN Name of information source or database

Alphanumeric value

Found in MRLO

Valid Values for Name of information source:

HDA	Health Devices Alerts (ECRI) (1999)
HPC	Health Product Comparison System (ECRI) (1999)
MBD/ MED	MEDLINE (National Library of Medicine) will be followed by an indication of applicable range of years of MEDLINE data
DXP	DXPLAIN a diagnostic prompting system (Massachusetts General Hospital (1996)
OMIM	OMIM Online Mendelian Inheritance in Man (Victor McKusick, Johns Hopkins University) (1996)
PDQ	PDQ Physician Data Query System (National Cancer Institute) (2002)
QMR	QMR Quick Medical Reference (First Databank) (1996)
AIR	AI/RHEUM (National Library of Medicine) (1996)

LAT Language of Term

Three alpha characters

Found in MRCON, the Word Index files, MRSAB and DELETED.SUI

Valid values:

BAQ	Basque
DAN	Danish
DUT	Dutch
ENG	English
FIN	Finnish
FRE	French
GER	German
HEB	Hebrew
HUN	Hungarian
ITA	Italian
NOR	Norwegian
POR	Portuguese
RUS	Russian
SPA	Spanish
SWE	Swedish

The USMARC (Machine-Readable Cataloging) abbreviation for the language of the term. Present in the 2003AA Metathesaurus are Basque, Danish, Dutch, English, Finnish, French, German, Hebrew, Hungarian, Italian, Norwegian, Portuguese, Spanish, and Swedish terms.

LRL Least Restriction Level

Integer

Found in MRCON

The least restrictive "Category of additional restrictions" of the vocabularies which are sources for this string. See SRL for the meaning of each level and the UMLS License agreement for the restriction level of any source vocabulary.

LUI Lexical Unique Identifier

The letter L followed by seven digits

Found in MRCON, MRSAT, MRSO, Word Indexes, AMBIG.LUI, DELETED.LUI and MERGED.LUI

The unique identifier for the group of lexical variants (term) of which a string is one form. A LUI may be linked to multiple CUIs in the Metathesaurus. Strings which share a LUI have the same normalized string form, as produced by the Specialist "norm" program distributed with the Metathesaurus. Changes in "norm" versions may cause strings to be assigned to different LUIs in different editions of the Metathesaurus.

MAPIN Mapping in current MetamorphoSys subset

Found in MRCUI

For use with MetamorphoSys, indicates whether a CUI is in the subsetted Metathesaurus created when MetamorphoSys is run.

Valid Values:

Y=CUI2 is in subset

N=CUI2 is not in subset

Null

MAX Maximum Length, in bytes

Numeric value

Found in MRCOLS

MG Imprecise Relationship Indicator

Found in MRREL

Valid Value for Imprecise Relationship Indicator:

The single character G.

This indicator is used when the Relationship Labels have been machine-generated for the Metathesaurus based on ambiguous information from a source and have not been reviewed again in the Metathesaurus. There is therefore a possibility that the nature of the relationship has been labeled incorrectly. In the current version of the Metathesaurus, there are no relationships with this indicator. It was used in previous editions for MeSH Supplementary Concepts which had not been reviewed in a concept-oriented system.

MIN Minimum Length, in bytes

Numeric value

Found in MRCOLS

NSTR Normalized String

Alphanumeric value

Found in MRXNS.ENG

In lowercase form.

NWD Normalized Word

Alphanumeric value

Found in MRXNW.ENG

In lowercase form.

RANK Source/Term Type ranking

Numeric value

Found in MRRANK

Is a numeric order of precedence with the higher value winning.

Example: 0210, 0209

RCUI Root source CUI

Found in MRSAB

Concept Unique Identifier for the root SRC concept for a source.

REF Documentation Section Number

Numeric value

Found in MRCOLS

Currently empty because all are linked from the file description to this appendix.

REL Relationship

Found in MRREL and MRATX.

The relationship which the second concept (with Concept Unique Identifier CUI2) HAS TO the first concept (with Concept Unique Identifier CUI1).

RELS may be derived from a source vocabulary's explicit hierarchy (see also MRCXT), derived from other relationships in a source vocabulary, created from information about allowed qualifiers in a source vocabulary, found in Metathesaurus QA of lexical and semantic matches, or added by Metathesaurus editors.

There are separate RELS for each direction of the relationship, e.g., one entry for "Atrial Fibrillation" as a child of "Arrhythmia" and another entry for "Arrhythmia" as a parent of "Atrial Fibrillation".

*Note: The allowed values for the REL field differ in MRREL and MRATX.

Valid Values for REL in MRREL:

RB has a broader relationship

RN has a narrower relationship

RO has relationship other than synonymous, narrower, or broader

RL the relationship is similar or "alike". the two concepts are similar or "alike". In the current edition of the Metathesaurus, most relationships with this attribute are mappings provided by a source.

RQ source asserted relatedness and possibly synonymous.

SY source asserted synonymy.

PAR has parent relationship in a Metathesaurus source vocabulary

CHD has child relationship in a Metathesaurus source vocabulary

SIB has sibling relationship in a Metathesaurus source vocabulary.

AQ is an allowed qualifier for the first concept in a Metathesaurus source vocabulary.

QB can be qualified by.

Valid Values for REL in MRATX:

RB has a broader relationship

RN has a narrower relationship

RO has relationship other than synonymous, narrower, or broader

SY has synonymous relationship

RU has an unspecified relationship

RELA Relationship Attribute

An attribute characterizing the nature of a relationship

Found in MRREL and MRCXT

Valid Values for Relationship Attributes:

Any of the relationships defined in the UMLS Semantic Network; these relationships are more principled; examples are *isa*, *part_of*, *branch_of*, *result_of*;

or

a more specific relationship provided by the source identified in the SAB (Abbreviation for source vocabulary) which is not one of the Semantic Network Relationships. These RELAs are listed in Appendix B.6. Examples are *mapped_to*, *clinically_associated_with*, *classified_as*. Both the SAB and RELA should be considered in deciding to use or reject relationships;

or

no value where further specification is not available.

The large majority of relationships have no Relationship Attribute, although the number with such attributes is increasing and this is a focus of NLM development.

RMETA Metathesaurus remove version

Found in MRSAB

The version of the Metathesaurus where a specific source version is removed.

Example: 2002AC

RNK Rank

Numeric value

Found in MRCXT

For rows with a CXL value of ANC, the rank of the ancestors (e.g., a value of 1 denotes the most remote ancestor in the hierarchy).

RSAB Root source abbreviation

Found in MRSAB

Root or versionless source abbreviation. Does not include version or year information.

Example: MSH, AOD, RCD

RWS Number of Rows

Numeric value

Found in MRFILES

SAB Source Abbreviation for source vocabulary

Found in MRREL, MRSAT, MRDEF, MRSO, MRCXT, MRATX, and MRRANK

An abbreviation of the name of a Metathesaurus source vocabulary. Starting with 2002AD, the SAB can be represented by either the [RSAB](#) (root source abbreviation) or [VSAB](#) (versioned source abbreviation). Allowed values are listed in [Appendix B, Section B.2](#), Vocabulary Source Abbreviations and in the SABDOC Bonus file available at:

<http://umlsinfo.nlm.nih.gov>

SABIN Source in current MetamorphoSys subset

Found in MRSAB

A Y or N flag indicating whether or not a row is represented in a current MetamorphoSys subset. Initially always Y where [CURVER](#) is Y, but later can be recomputed by MetamorphoSys.

SCC Source content contact

Found in MRSAB

Contains information on contact information for a specific source, when there are questions concerning the content of source.

SF Source family

Found in MRSAB

Source Family groupings defined for the Metathesaurus.

Example: ICPC, MSH

SL Source of Relationship labels

Found in MRREL.

Valid Values for Source of Relationship Labels:

Any source vocabulary abbreviation (see Section B.2).

This is the source of the information about the specific nature of the relationship, i.e., RB, RN, or RO and any Relationship attribute (RELA) values. In many cases, this is the same as the source of the relationship. In some cases, the particular nature of the relationship was added in Metathesaurus construction and the Source of Relationship Labels is MTH. Note that SL is not simply the source of the RELA.

SLC Source license contact

Found in MRSAB

Source contact information regarding licensing issues. May be different from the source content contact information.

SNA Actual name that occurs in the information source if not otherwise present in the Metathesaurus

Alphanumeric value

Found in MRLO

An optional field.

SOC Source of co-occurrence information in MRCOC

Alphanumeric value

Found in MRCOC

Valid values for Source of co-occurrence:

MED	MEDLINE (1998-2003)
MBD	MEDLINE (1993-1997)
AIR	AI/RHEUM
CCPSS	Canonical Clinical Problem Statement System

SON Official source name

Found in MRSAB

The official name for a source.

Example: Medical Subject Headings, Alcohol and Other Drug Thesaurus

SOUI Unique identifier of record in which the concept appears in source

Found in MRLO

An optional field.

SRL Source Restriction Level

Integer

Found in MRSO and MRSAB

The "Category of additional restrictions" of the vocabulary source of this string. See the UMLS License agreement for the meaning of each level, and for the restriction level for any source vocabulary.

Valid Values:

- 0 No additional restrictions.
- 1 LICENSEE is prohibited from translating the vocabulary source into another language or from producing other derivative works based on this single vocabulary source.
- 2 All category 1 restrictions AND

LICENSEE is prohibited from using the vocabulary source in operational applications that create records or information containing data from the vocabulary source. Use for data creation research or product development is allowed.

3 LICENSEE's right to use material from the source vocabulary is restricted to internal use at the LICENSEE's site(s) for research, product development, and statistical analysis only. Internal use includes use by employees, faculty, and students of a single institution at multiple sites. Notwithstanding the foregoing, use by students is limited to doing research under the direct supervision of faculty. Internal research, product development, and statistical analysis use expressly excludes: use of material from these copyrighted sources in routine patient data creation; incorporation of material from these copyrighted sources in any publicly accessible computer-based information system or public electronic bulletin board including the Internet; publishing or translating or creating derivative works from material from these copyrighted sources; selling, leasing, licensing, or otherwise making available material from these copyrighted works to any unauthorized party; and copying for any purpose except for back up or archival purposes.

LICENSEE may be required to display special copyright notices before displaying data from the vocabulary source. Applicable notices are included in the list of UMLS Metathesaurus Vocabulary sources, that is part of the "License Agreement for Use of UMLS Products".

STR String

Variable length string that includes alpha characters and may also include numerics, punctuation, or any character in the Metathesaurus character set

Found in MRCON and DELETED* files

A unique string or concept name that appears in one or more of the Metathesaurus source vocabularies. Any variation in upper-lower case is a separate string. The same string in different languages (e.g., English, Spanish) will have a different string identifier for each language.

STT String Type

Variable length string up to three characters

Found in MRCON

Valid values:

PF Preferred form of term OR

V Followed by one or more of the following types of variation, in this order:

- C Varies from the preferred term only in upper-lower case
- W Contains same words as the preferred form, disregarding order and punctuation
- S Singular of the preferred form
- P Plural of the preferred form
- O Other variant of the preferred form

An indication of whether the string is the preferred form of the term or a variant of that form. Variant tags (e.g., W,S,P) were assigned by computer algorithm.

NOTE: The Metathesaurus includes only those variants that are actually present in the Metathesaurus source vocabularies. The SPECIALIST Lexicon and Tools provide principled normalization functions which allow retrieval across lexical variation where specific variants do not exist in the source vocabularies. The algorithm used to identify lexical variants in the Metathesaurus is described in [Section 4](#) and appears in the LEX directory.

MeSH includes a more complete set of lexical variants for its terms than other Metathesaurus sources. MeSH variants ("permuted terms", MSH/PM) are reviewed to exclude cases where the meaning is incorrect, although some inelegant forms exist.

STY Semantic Type

Found in MRSTY

Repeating element with the two subelements:

1. TUI Unique identifier for Semantic type
2. STY Semantic type

Valid Values for Unique identifiers

The identifiers in the UMLS Semantic Network.

Valid Values for Semantic Types:

The semantic types in the UMLS Semantic Network.

The basic category or categories to which the concept belongs, (e.g., Acquired Immunodeficiency Syndrome is a "Disease or Syndrome"), assigned by editors for all reviewed concepts. The Semantic type(s) are the link between the Metathesaurus and the UMLS Semantic Network. Application programs may be able to use the semantic type information to determine the general topics of interest in a particular user query.

SUI Unique Identifier for String

The letter S followed by seven digits

Found in MRCON, MRSAT, MRSO, MRCXT, MRLO, Word Indexes, MRXNW.ENG, MRXNS.ENG, AMBIG.SUI, and DELETED.SUI

The unique identifier for each string in the Metathesaurus. String identity is case sensitive - i.e., strings which differ only in case will receive different SUIs. This identifier remains the same across versions of the Metathesaurus. Each SUI is linked to a single LUI that represents the group of all strings that are lexical variants of each other. In cases where a single string can name multiple concepts, a SUI will be linked to multiple CUIs in the Metathesaurus.

SUPRES Suppressible Flag

One alphabetic character

Found in MRRANK

Flag indicating that this SAB and TTY will create a TS=s MRCON entry.

SVER Source version

Found in MRSAB

Release date or version of a specific source

Example: 5.1, 2001

TFR Term frequency for a source

Found in MRSAB

The number of strings (CUI|SUI) for each version of a source.

Example: 12343

TS Term Status

One alpha character

Found in MRCON

Valid values:

P	Preferred Name
S	Synonym
p	Suppressible preferred name
s	Suppressible synonym

An indication of whether the term is the preferred name of the concept to which it is linked, or a synonym of the preferred name. There is a separate preferred name for each language.

In MetamorphoSys, it is possible to make selected Sources (SABs) and Term Types (TTYs) suppressible. Under some circumstances, the selection may include the preferred form of the preferred term. In that case, the Term Status is now set to 'p' (lowercase p) to indicate that the preferred form is suppressible. This situation may cause problems for users' programs in cases where the new value is not anticipated. MetamorphoSys itself will now handle the new value correctly, so its output can become the input for another run.

Suppressible synonyms are less useful and possibly problematic for some applications, e.g. abbreviations, not fully specified or face-invalid names, which many users may wish to eliminate.

TTY Abbreviation for the type of name in a source vocabulary

Found in MRSO and MRRANK

An abbreviation for the type of concept name in a Metathesaurus source vocabulary, for example PT for preferred terms. Allowed values are listed in Appendix B.4, Types of Names in a Vocabulary - the TTY and in the TTYDOC Bonus file available at:

<http://umlsinfo.nlm.nih.gov>

TTYL Term type list for a source

Found in MRSAB

List of all term types in a specific source. A full list of the term types can be found in [Appendix B.4](#).

Example: PT, EN

TUI Unique Identifier of Semantic Types

T followed by 3 numbers

Found in MRSTY

Valid values are found in the Semantic Network.

UN Meaning of frequency

Found in MRLO and is an optional field.

Valid value for meaning of frequency data:

*CITATIONS

Examples:

MBD|12|*CITATIONS|

VCUI Versioned source CUI

Found in MRSAB

CUI of the versioned SRC concept for a source.

VEND Valid end date for a source

Found in MRSAB

VSAB Versioned source abbreviation

Found in MRSAB

The versioned source abbreviation.

Example: MSH2003_2002_10_24

VSTART Valid start date for a source

Found in MRSAB

WD Word in Lowercase

Alphanumeric value

Found in Word Index files

XC Has Child

Found in MRCXT

A plus(+) sign indicates that the CUI2 for this row has children in this context. If this field is empty, the CUI2 does not have children in this context.

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B.1.2 Attribute Descriptions

AM Ambiguous string indicator

The value format has two subelements, separated by a ":"

1. A single character: A

An indicator that the case-insensitive string is ambiguous, i.e., has more than one meaning in the Metathesaurus. (See Section [2.2.2](#) and [Figure 2](#) in this documentation). An ambiguous string has multiple entries in the Metathesaurus. These entries have the same CASE-INSENSITIVE string, but different concept identifiers (CUIs). Note that SUIs will differ where there are case differences.

2. The SUI of the corresponding disambiguating string (optional).

The disambiguating strings are Metathesaurus "Preferred Names" (MTH/PN), created by Metathesaurus editors to help distinguish the meanings of identical strings.

Example: A:S0987654

AN MeSH Annotation

Variable length alphanumeric string that may contain punctuation.

An informative MeSH note written primarily for indexers or catalogers that may also be useful in explaining the use of a MeSH term to online searchers.

AQL Allowable Qualifier

A list of allowable qualifier abbreviations for MeSH main headings.

This information is also released in MRREL as AQ. In previous releases, this was only released as AQ.

Examples: AA, CL, CS, DF, DU, IM, IP, ME, PK

ATC Alternative Billing Codes Tree Code

Actual alternative medicine billing alphabetic code string. Treenumbers for context in MRCXT.

AXR Alternative Billing Codes Mapped to NIC

NIC codes mapped to AltLink's ABC codes

Examples: AXR|ALT|2311
 AXR|ALT|2304

CCF Canonical Clinical Problem Statement System (CCPSS) frequency

Numeric characters.

The number of times a CCPSS term appears in a patient record.

CCI ICD-9-CM code(s) clusters in a Clinical Classifications Software (CCS) category

Individual ICD-9-CM codes (or ranges of such codes) classified into CCS categories.

CFR Code of Federal Regulation Number

Numeric characters.

Sample of valid values:

862.3220
892.1610

CPA CPT Short Description

Variable length alphanumeric string with embedded punctuation.

The CPT abbreviated procedure description. (These are not unique, i.e., multiple long forms may have the same short form).

Examples:

ANESTH, TYMPANOTOMY
 DIALYSIS, REPEATED EVAL.

CPF CPT Full Procedure

Variable length alphanumeric string with embedded punctuation.

The complete text of the CPT full procedure, in cases where the CPT term in the "STR" field of MRCON has been trimmed from its original form. Trimming occurred in the modifiers and where the term exceeded 750 characters in length. Note that some full procedures may be several thousand characters long.

Example:

UNUSUAL PROCEDURAL SERVICES: When the service(s) provided is greater than that usually required for the listed procedure, it may be identified by adding modifier '-22' to the usual procedure number or by use of the separate five digit modifier code 09922. A report may also be appropriate

CX Consider Also Note (MeSH only)

Variable length alphabetic string.

Other word roots or prefixes that should be consulted for concepts related to this MeSH concept, e.g., the value for "Heart" is "consider also terms at cardi- and myocardi-".

DA Date of entry

YYYYMMDD, e.g., 19920830

The date of entry of the concept into the Metathesaurus.

DC MeSH Descriptor class

A single numeric character. The type of MeSH term the concept name represents.

Valid Values:

- 1 = an Index Medicus descriptor
- 2 = a citation type descriptor (English Abstract)
- 3 = a check tag descriptor, e.g., HUMAN
- 4 = a geographic descriptor

DCSA Controlled Substance Act designation code

Numerical code.

Sample of Valid Values:

0
4

DDF Drug Doseform

Variable length alphabetic string.

Sample of Valid Values:

chewable tablet
inhaler

DDFA Drug Doseform Abbreviation

Variable length alphabetic string.

Sample of Valid Values:

SOLN
CAP

DHJC HCPCS J-code

The character J followed by numbers.

Multum clinical drugs linked to HCPCS J-codes where applicable.

Sample of Valid Values:

J7507
J7625

DID Descriptor Identifier

The identifier for the "descriptor class" in a given source, this value may be the same as the source code.

2003AC has DID attributes from three sources:

MeSH: The DID is the descriptor identifier, e.g. D012711

MedDRA: The DID is the preferred MedDRA code. In MedDRA, a lower level term may have a different code from its preferred term. A DID is present for all preferred and lower level MedDRA terms, with the value of the code of the preferred term. This attribute was formerly called "MPC" for MedDRA. In the future, many sources will include a "DID" attribute.

UMD: DID is the UMD code

Examples:

(MedDRA)
DID|10000085
DID|10000060

(MeSH)
DID|D012711
DID|D015060

DIV NCBI Division

Variable length characters.

The attribute was added for NCBI2003 to represent the division (phyla).

Examples:

DIV|NCBI|Virus
DIV|NCBI|Plant

DPC Pregnancy Hazard Classification Code

Single alphabetic character.

Pregnancy Hazard Classification codes assigned to Multum clinical drugs.

Sample of Valid Values:

X
D

DQ Date Qualifier Established (MeSH only)

YYYYMMDD

The date the qualifier became available for indexing MEDLINE citations.

DRT Drug Route of Administration

Variable length alphabetic string.

Sample of Valid Values:

Injection (systemic)
Intramuscular
Intravenous

DRTA Drug Route of Administration Abbreviation

Variable length alphabetic string.

Sample of Valid Values:

INJ
TOP

DS MeSH Descriptor Sort Version

Variable length alphanumeric string.

The form needed for proper sequencing of the concept name, if the name could not be sequenced properly by the sort algorithms used in the MeSH publications.

Example:

MC Antithrombin III DS Antithrombin 03

DST Drug Strength

Variable length alphanumeric string with embedded punctuation.

Sample of Valid Values:

0.01%
0.02 MG
0.02 MG/ML

DX MeSH Date major descriptor established

YYYYMMDD

The first day of the Index Medicus publication month in which the descriptor (in any form) was available for searching as a major descriptor.

EC MeSH Entry combination

Variable length alphanumeric string with two subelements, separated by a colon (:)

1. Two character abbreviation for MeSH subheading
2. MeSH main heading

An invalid MeSH main heading/subheading combination that is a cross reference to a single MeSH main heading or a main heading/subheading combination that should be used in its place.

EV MeSH Entry term abbreviation

Variable length alphanumeric string.

A short form for a MeSH entry term or cross reference used primarily in MEDLINE record creation and maintenance.

EZ Enzyme Commission Number

A numeric string with embedded periods.

The International Union of Biochemists Enzyme Commission number for an enzyme concept. This number is an alias for the concept name and can be used to retrieve information about the concept from some databases. Enzyme commission numbers may also appear

in the RN field, preceded by the designation EC.

FR MeSH Frequency

Numeric value

For MeSH supplementary concepts only, the number of times the chemical has been identified in articles indexed in MEDLINE as of January 2002.

FX MeSH MH Mapping

Maps a MeSH MH to a 'See Related' MH.

GAN Genbank Accession Number

Numeric value

GXR GO Cross Reference

GO cross reference to external databases

Examples: GXR|GO|MetaCyc:TRNA-CHARGING-PWY
GXR|GO|MetaCyc:P102-PWY

HAB HCPCS abbreviation (short form)

Short descriptive text of procedure code (28 characters or less).

Standard alias: HCPCS_SHRT_DESC_TXT

SAS alias: SHRTDESC

Example: for the "long form" of:

D9110 | PALLIATIVE (EMERGENCY) TREATMENT OF DENTAL PAIN-MINOR PROCEDURES

There is a HAB of:

Tx dental pain minor proc

HAC HCPCS action code

A code denoting the change made to a procedure or modifier code within the HCPCS system. There are two subelements separated by "=". The first subelement is the HCPCS abbreviation of the value. The second subelement is the expanded value.

Standard alias: HCPCS_ACTN_CD

SAS alias: ACTN_CD

Valid Values:

A	=	ADD PROCEDURE OR MODIFIER CODE
B	=	CHANGE IN BOTH ADMINISTRATIVE DATA FIELD AND LONG DESCRIPTION OR PROCEDURE OR MODIFIER CODE
C	=	CHANGE IN LONG DESCRIPTION OF PROCEDURE OR MODIFIER CODE
D	=	DISCONTINUE PROCEDURE OR MODIFIER CODE
F	=	CHANGE IN ADMINISTRATIVE DATA FIELD OF PROCEDURE OR MODIFIER CODE
N	=	NO MAINTENANCE FOR THIS CODE
P	=	PAYMENT CHANGE (MOG, PRICING INDICATOR CODES, ANESTHESIA BASE UNITS)
R	=	RE-ACTIVATE DISCONTINUED/DELETED PROCEDURE
S	=	CHANGE IN SHORT DESCRIPTION OF PROCEDURE CODE
T	=	MISCELLANEOUS CHANGE (BETOS, TYPE OF SERVICE)

HAD HCPCS Action Effective Date

Effective data of action to a procedure or modifier code.

Standard alias: HCPCS_ACTN_EFCTV_DT

SAS alias: EFCTV_DT

Format: eight digits YYYYMMDD format

HAQ HCPCS Anesthesia Base Unit Quantity

The base unit represents the level of intensity for anesthesia procedure services that reflects all activities except time. These activities include usual pre-operative and post-operative visits, the administration of fluids and/or blood incident to anesthesia care, and monitoring procedures. (Note: The payment amount for anesthesia services is based on a calculation using base unit, time units, and the conversion factor).

Valid value: "0" (zero) or a three-digit number (i.e., 007)

HBT HCPCS Berenson-Eggers Type of Service Code

The Berenson-Eggers Type of Service (BETOS) for the procedure code based on generally agreed upon clinically meaningful groupings of procedures and services. There are two subelements separated by "=". The first subelement is the HCPCS abbreviation of the value. The second subelement is the expanded value.

Standard alias: HCPCS_BETOS_CD

SAS alias: BETOS

Title alias: BETOS_CD

Valid Values:

D1A	=	MED/SURG SUPPLIES
D1B	=	HOSPITAL BEDS
D1C	=	OXYGEN AND SUPPLIES
D1D	=	WHEELCHAIRS
D1E	=	OTHER DME

D1F = ORTHOTIC DEVICES

D1G = DRUGS ADMINISTERED THROUGH DME

I1A = STANDARD IMAGING - CHEST

I1B = STANDARD IMAGING - MUSCULOSKELETAL

I1C = STANDARD IMAGING - BREAST

I1D = STANDARD IMAGING - CONTRAST G.I.

I1E = STANDARD IMAGING - NUCLEAR MEDICINE

I1F = STANDARD IMAGING - OTHER

I2A = ADVANCED IMAGING - CAT: HEAD

I2B = ADVANCED IMAGING - CAT: OTHER

I2C = ADVANCED IMAGING - MRI: BRAIN

I2D = ADVANCED IMAGING - OTHER

I3A = ECHOGRAPHY - EYE

I3B = ECHOGRAPHY - ABDOMEN/PELVIS

I3C = ECHOGRAPHY - HEART

I3D = ECHOGRAPHY - CAROTID ARTERIES

I3E = ECHOGRAPHY - PROSTATE - TRANSRECTAL

I3F = ECHOGRAPHY - OTHER

I4A = IMAGING/PROCEDURE - HEART- INC CARDIAC CATH

I4B = IMAGING/PROCEDURE - OTHER

M1A = OFFICE VISITS - NEW

M1B = OFFICE VISITS - ESTABLISHED

M2A = HOSPITAL VISIT - INITIAL

M2B = HOSPITAL VISIT - SUBSEQUENT

M2C = HOSPITAL VISIT - CRITICAL CARE

M3 = EMERGENCY ROOM VISIT

M4A = HOME VISIT

M4B = NURSING HOME VISIT

M5A = SPECIALIST - PATHOLOGY

M5B = SPECIALIST - PSYCHIATRY

M5C = SPECIALIST - OPHTHALMOLOGY

M5D = SPECIALIST - OTHER

M6 = CONSULTATIONS

O1A = AMBULANCE

O1B = CHIROPRACTIC

O1C = ENTERAL AND PARENTERAL

O1D = CHEMOTHERAPY

O1E = OTHER DRUGS

O1F = VISION - HEARING AND SPEECH SERVICES

O1G = INFLUENZA VACCINE

P0 = ANESTHESIA

P1A = MAJOR PROCEDURE - BREAST

P1B = MAJOR PROCEDURE - COLECTOMY

P1C = MAJOR PROCEDURE - CHOLECYSTECTOMY

P1D = MAJOR PROCEDURE - TURP

P1E = MAJOR PROCEDURE - HYSTERECTOMY

P1F = MAJOR PROCEDURE - EXPLOR/DECOMPR/EXCIS DISC

P1G = MAJOR PROCEDURE - OTHER

P2A = MAJOR PROCEDURE - CARDIOVASCULAR - CABG

P2B = MAJOR PROCEDURE - CARDIOVASCULAR - ANEURYSM REPAIR

P2C = MAJOR PROCEDURE - CARDIOVASCULAR - THROMBOENDARTERECTOMY

P2D = MAJOR PROCEDURE - CARDIOVASCULAR - CORONARY ANGIOPLASTY (PTCA)

P2E = MAJOR PROCEDURE - CARDIOVASCULAR - PACEMAKER INSERTION

P2F = MAJOR PROCEDURE - CARDIOVASCULAR - OTHER

P3A = MAJOR PROCEDURE - ORTHOPEDIC - HIP FRACTURE REPAIR

P3B = MAJOR PROCEDURE - ORTHOPEDIC - HIP REPLACEMENT

P3C = MAJOR PROCEDURE - ORTHOPEDIC - KNEE REPLACEMENT

P3D = MAJOR PROCEDURE - ORTHOPEDIC - OTHER

P4A = EYE PROCEDURES - CORNEAL TRANSPLANT

P4B = EYE PROCEDURES - CATARACT REM/LENS INS

P4C = EYE PROCEDURES - RETINAL DETACHMENT

P4D = EYE PROCEDURES - TREATMENT OF RETINAL LESIONS

P4E = EYE - OTHER

P5A = AMBULATORY PROCEDURES - SKIN

P5B = AMBULATORY PROCEDURES - MUSCULOSKELETAL

P5C = AMBULATORY PROCEDURES - GROIN HERNIA REPAIR

P5D = AMBULATORY PROCEDURES - LITHOTRIPSY

P5E = AMBULATORY PROCEDURES - OTHER

P6A = MINOR PROCEDURES - SKIN

P6B = MINOR PROCEDURES - MUSCULOSKELETAL

P6C = MINOR PROCEDURES - OTHER (MFS)

P6D = MINOR PROCEDURES - OTHER (NON MFS)

P7A = ONCOLOGY - RADIATION THERAPY

P7B = ONCOLOGY - OTHER

P8A = ENDOSCOPY - ARTHROSCOPY

P8B = ENDOSCOPY - UPPER G.I.

P8C = ENDOSCOPY - SIGMOIDOSCOPY

P8D = ENDOSCOPY - COLONOSCOPY

P8E = ENDOSCOPY - CYSTOSCOPY

P8F = ENDOSCOPY - BRONCHOSCOPY

P8G = ENDOSCOPY - LAPAROSCOPIC CHOLECYSTECTOMY

P8H = ENDOSCOPY - LARYNGOSCOPY

P8I = ENDOSCOPY - OTHER

P9A = DIALYSIS SERVICE (MFS)

P9B = DIALYSIS SERVICES (NOT MFS)

T1A = LAB TESTS - ROUTINE VENIPUNCTURE (NOT MFS)

T1B = LAB TESTS - AUTOMATED GENERAL PROFILES

T1C = LAB TESTS - URINALYSIS

T1D	=	LAB TESTS - BLOOD COUNTS
T1E	=	LAB TESTS -GLUCOSE
T1F	=	LAB TESTS - BACTERIAL CULTURES
T1G	=	LAB TEST - OTHER (MFS)
T1H	=	LAB TEST - OTHER (NON MFS)
T2A	=	OTHER TESTS - ELECTROCARDIOGRAMS
T2B	=	OTHER TESTS - CARDIOVASCULAR STRESS TESTS
T2C	=	OTHER TESTS - EKG MONITORING
T2D	=	OTHER TESTS - OTHER
Y1	=	OTHER - MEDICARE FEE SCHEDULE
Y2	=	OTHER - NON MEDICARE FEE SCHEDULE
Z1	=	LOCAL CODES
Z2	=	UNDEFINED CODES

HCC HCPCS Coverage Code

A code denoting Medicare coverage status. There are two subelements separated by "=". The first subelement is the HCPCS abbreviation of the value. The second subelement is the expanded value.

Standard alias: HCPCS_CVRG_CD

SAS alias: CVRG_CD

Valid Values:

C	=	CARRIER JUDGMENT
D	=	SPECIAL COVERAGE INSTRUCTIONS APPLY
G	=	NOT VALID FOR MEDICARE (90 DAY GRACE PERIOD)

I	=	NOT VALID FOR MEDICARE (NO GRACE PERIOD)
M	=	NON-COVERED BY MEDICARE
S	=	NON-COVERED BY MEDICARE STATUTE

HCD HCPCS Code Added Date

The year the HCPCS code was added to the HCFA Common Procedure Coding System.

Standard alias: HCPCS_CD_AD_DT

SAS alias: ADD_DT

Format: YYYYMMDD

HIR HCPCS Coverage Issues Manual Reference Section Number

Number identifying the Reference Section of the Coverage Issues Manual.
Repeating element.

Standard alias: HCPCS_CIM_RFRNC_SECT_NUM

SAS alias: CIM

Example: 70-1; 70-2

HLC HCPCS Lab Certification Code

Code used to classify laboratory procedures according to the specialty certification categories listed by HCFA. Any generally certified laboratory (e.g.100) may perform any of the tests in its subgroups (e.g. 110, 120, etc.). There are two subelements separated by "=" . The first subelement is the HCPCS abbreviation of the value. The second subelement is the expanded value.
Repeating element.

Standard alias: HCPCS_LAB_CRTFCTN_CD

SAS alias: LABCERT

Valid Values:

010	=	HISTOCOMPABILITY TESTING
100	=	MICROBIOLOGY
110	=	BACTERIOLOGY
115	=	MYCOBACTERIOLOGY
120	=	MYCOLOGY
130	=	PARASITOLOGY
140	=	VIROLOGY
150	=	OTHER MICROBIOLOGY
200	=	DIAGNOSTIC IMMUNOLOGY
210	=	SYPHILIS SEROLOGY
220	=	GENERAL IMMUNOLOGY
300	=	CHEMISTRY
310	=	ROUTINE CHEMISTRY
320	=	URINALYSIS
330	=	ENDOCRINOLOGY
340	=	TOXICOLOGY
350	=	OTHER CHEMISTRY
400	=	HEMATOLOGY
500	=	IMMUNOHEMATOLOGY

510	=	ABO GROUP & RH TYPE
520	=	ANTIBODY DETECTION (TRANSFUSION)
530	=	ANTIBODY DETECTION (NONTRANSFUSION)
540	=	ANTIBODY IDENTIFICATION
550	=	COMPATIBILITY TESTING
560	=	OTHER IMMUNOHEMATOLOGY
600	=	PATHOLOGY
610	=	HISTOPATHOLOGY
620	=	ORAL PATHOLOGY
630	=	CYTOLOGY
800	=	RADIOBIOASSAY
900	=	CLINICAL CYTOGENETICS

HM MeSH Heading Mapped To

The heading mapped to attribute in C-MeSH containing repeating (MH or MH/SH) elements.

Example: HM = PYRROLIDINONES

 HM = *TARTRATES

 HM = ESTRONE/* analogs & derivatives

HMP HCPCS Multiple Pricing Indicator Code

Code used to identify instances where a procedure could be priced. There are two subelements separated by "=". The first subelement is the HCPCS abbreviation of the value. The second subelement is the expanded value.

Standard alias: HCPCS_MLTPL_PRCNG_IND_CD

SAS alias: MULTCD

Valid Values:

- 9 = NOT APPLICABLE AS HCPCS NOT PRICED SEPARATELY BY PART B (PRICING INDICATOR IS 00) OR VALUE IS NOT ESTABLISHED (PRICING INDICATOR IS '99')
- A = NOT APPLICABLE AS HCPCS PRICED UNDER ONE METHODOLOGY
- B = PROFESSIONAL COMPONENT OF HCPCS PRICED USING RVU'S, WHILE TECHNICAL COMPONENT AND GLOBAL SERVICE PRICED BY MEDICARE PART B CARRIERS
- C = PHYSICIAN INTERPRETATION OF CLINICAL LAB SERVICE IS PRICED UNDER PHYSICIAN FEE SCHEDULE USING RVU'S, WHILE PRICING OF LAB SERVICE IS PAID UNDER CLINICAL LAB FEE SCHEDULE
- D = SERVICE PERFORMED BY PHYSICIAN IS PRICED UNDER PHYSICIAN FEE SCHEDULE USING RVU'S, WHILE SERVICE PERFORMED BY CLINICAL PSYCHOLOGIST IS PRICED UNDER CLINICAL PSYCHOLOGIST FEE SCHEDULE
- E = SERVICE PERFORMED BY PHYSICIAN IS PRICED UNDER PHYSICIAN FEE SCHEDULE USING RVU'S, SERVICE PERFORMED BY CLINICAL PSYCHOLOGIST IS PRICED UNDER CLINICAL PSYCHOLOGIST'S FEE SCHEDULE AND SERVICE PERFORMED BY CLINICAL SOCIAL WORKER IS PRICED UNDER CLINICAL SOCIAL WORKER FEE SCHEDULE
- F = SERVICE PERFORMED BY PHYSICIAN IS PRICED UNDER PHYSICIAN FEE SCHEDULE BY CARRIERS. SERVICE PERFORMED BY CLINICAL PSYCHOLOGIST IS PRICED UNDER CLINICAL PSYCHOLOGIST'S FEE SCHEDULE AND SERVICE PERFORMED BY CLINICAL SOCIAL WORKER IS PRICED UNDER CLINICAL SOCIAL WORKER FEE SCHEDULE
- G = CLINICAL LAB SERVICE PRICED UNDER REASONABLE CHARGE WHEN SERVICE IS SUBMITTED ON CLAIM WITH BLOOD PRODUCTS, WHILE SERVICE IS PRICED UNDER CLINICAL LAB FEE SCHEDULE WHEN THERE ARE NO BLOOD PRODUCTS ON CLAIM

HMR HCPCS Medicare Carriers Manual reference section number

Number identifying a section of the Medicare Carriers Manual

Repeating element.

Standard alias: HCPCS_MGM_RFRNC_SECT_NUM

SAS alias: MCM

Example: 2215

HN History Note

Variable length alphanumeric string with punctuation.

For MeSH history notes, the year when the current form of the MeSH term was established as a major and/or minor descriptor. The minor descriptor entry data appears in parentheses. Other brief information about history of the MeSH heading and its cross-references may follow the year data. MeSH terms that have been used continuously as major descriptors since 1963 do not have dates in this element.

The information in this field can be used to determine whether a MeSH term will appear in early MEDLINE backfiles and to find out how to search a concept in MEDLINE before its current term was introduced into MeSH.

For AOD history notes, a short text field describing the year the term was introduced or the history of the usage of the term.

Examples:

72 (68)

83

76 (75)

Changed descriptor 2000; through 1999 use "gestation."

HPD HCPCS ACD payment group effective date

The date the procedure is assigned to the ASC payment group.

Standard alias: HCPCS_ASC_PMT_GRP_EFCT_DT

SAS alias: ASCGRP

Eight digits YYYYMMDD

HPG HCPCS ASC payment group code

Standard alias: HCPCS_ASC_PMT_GRP_CO

SAS alias: ASCIND

Edit rules: Range 01 to 09

The code which represents the dollar amount of the facility charge payable by Medicare for the procedure. Payment group rates, which are updated annually (most recently on October 1, 1997), are as follow:

Group 1	-	\$333
Group 2	-	\$446
Group 3	-	\$510
Group 4	-	\$630
Group 5	-	\$717
Group 6	-	\$826 (\$676+\$150)*
Group 7	-	\$995
Group 8	-	\$973 (\$823+\$150)*
Group 9	-	\$1339

*The \$150 payment allowance in Group 6 and 8 is for intraocular lenses.

HPI HCPCS Pricing Indicator Code

Code used to identify the appropriate methodology for developing unique pricing amounts under Part B. A procedure may have one to four pricing codes. The identification is not all inclusive, as it excludes those prices where methodology is also identified by type of provider/supplier (i.e. nurse practitioner, physician assistant, clinical psychologist, clinical social worker, etc.). There are two subelements separated by "=" . The first subelement is the HCPCS abbreviation of the value. The second subelement is the expanded value.

Repeating element.

Standard alias: HCPCS_PRCNG_IND_CD

SAS alias: PRCNGCD

Valid Values:

- 00 = SERVICE NOT SEPARATELY PRICED BY PART B (E.G., SERVICES NOT COVERED, BUNDLED, USED BY PART A ONLY, ETC.)
- 11 = PRICE ESTABLISHED USING NATIONAL RVU'S
- 12 = PRICE ESTABLISHED USING NATIONAL ANESTHESIA BASE UNITS
- 13 = PRICE ESTABLISHED BY CARRIERS (E.G., NOT OTHERWISE CLASSIFIED, INDIVIDUAL DETERMINATION, CARRIER DISCRETION)
- 21 = PRICE SUBJECT TO NATIONAL LIMITATION AMOUNT
- 22 = PRICE ESTABLISHED BY CARRIERS (E.G., GAP-FILLS, CARRIERS ESTABLISHED PANELS)
- 31 = FREQUENTLY SERVICED DME (PRICE SUBJECT TO FLOORS AND CEILINGS)
- 32 = INEXPENSIVE AND ROUTINELY PURCHASED DME (PRICE SUBJECT TO FLOORS AND CEILINGS)
- 33 = OXYGEN AND OXYGEN EQUIPMENT (PRICE SUBJECT TO FLOORS AND CEILINGS)
- 34 = DME SUPPLIES (PRICE SUBJECT TO FLOORS AND CEILINGS)
- 35 = SURGICAL DRESSINGS (PRICE SUBJECT TO FLOORS AND CEILINGS)
- 36 = CAPPED RENTAL DME (PRICE SUBJECT TO FLOORS AND CEILINGS)
- 37 = OSTOMY, TRACHEOSTOMY AND UROLOGICAL SUPPLIES (PRICE SUBJECT TO FLOORS AND CEILINGS)
- 38 = ORTHOTICS, PROSTHETICS, PROSTHETIC DEVICES & VISION SERVICES (PRICE SUBJECT TO FLOORS AND CEILINGS)
- 39 = PARENTERAL AND ENTERAL NUTRITION
- 45 = CUSTOMIZED DME ITEMS

46	=	CARRIER PRICED (E.G., NOT OTHERWISE CLASSIFIED, INDIVIDUAL DETERMINATION, CARRIER DISCRETION, GAP-FILLED AMOUNTS)
51	=	DRUGS
52	=	REASONABLE CHARGE
53	=	STATUTE
54	=	VACCINATIONS
55	=	PRICED BY CARRIERS UNDER CLINICAL PSYCHOLOGIST FEE SCHEDULE
56	=	PRICED BY CARRIERS UNDER CLINICAL SOCIAL WORKER FEE SCHEDULE
57	=	OTHER CARRIER PRICED
99	=	VALUE NOT ESTABLISHED

HPN HCPCS processing note number

The number identifying the processing note contained in Appendix A of the HCPCS Manual.

Standard alias: HCPCS_PRCSG_NOTE_NUM

SAS alias: PROCNOTE

example: 0041

HSN HCPCS Statute Number

Number identifying statute reference for coverage or noncoverage of procedure or service.

Standard alias: HCPCS_STATUTE_NUM

SAS alias: STATUTE

example: 1862 A(12)

HTD HCPCS Termination Date

Last date for which a procedure or code may be used by Medicare Providers.

Standard alias: HCPCS_TRMNTN_DT

SAS alias: TERM_DT

Eight Digits YYYYMMDD

HTS HCPCS Type of Service Code

The carrier assigned HCFA Type of Service which describes the particular kind(s) of service represented by the procedure code. There are two subelements separated by "=" . The first subelement is the HCPCS abbreviation of the value. The second subelement is the expanded value.

Repeating element.

Standard alias: HCPCS_TYPE_SRVC_CD

SAS alias: TYPESRVC

Valid Values:

0	=	WHOLE BLOOD OR PACKED RED CELLS
1	=	MEDICAL CARE
2	=	SURGERY
3	=	CONSULTATION
4	=	DIAGNOSTIC RADIOLOGY
5	=	DIAGNOSTIC LABORATORY

6	=	THERAPEUTIC RADIOLOGY
7	=	ANESTHESIA
8	=	ASSISTANT AT SURGERY
9	=	OTHER MEDICAL ITEMS OR SERVICES
A	=	USED DURABLE MEDICAL EQUIPMENT (DME)
B	=	HIGH RISK SCREENING MAMMOGRAPHY
C	=	LOW RISK SCREENING MAMMOGRAPHY
D	=	AMBULANCE (EFF 04/95)
E	=	ENTERAL/PARENTERAL NUTRIENTS/SUPPLIES (EFF 04/95)
F	=	AMBULATORY SURGICAL CENTER (FACILITY USAGE FOR SURGICAL SERVICES)
G	=	IMMUNOSUPPRESSIVE DRUGS
H	=	HOSPICE SERVICE (DISCONTINUED 01/95)
I	=	PURCHASE OF DME (INSTALLMENT BASIS) (DISCONTINUED 04/95)
J	=	DIABETIC SHOES (EFF 04/95)
K	=	HEARING ITEMS AND SERVICES (EFF 04/95)
L	=	ESRD SUPPLIES (EFF 04/95) (RENAL SUPPLIER IN THE HOME BEFORE 04/95)
M	=	MONTHLY CAPATAION FOR DIALYSIS
N	=	KIDNEY DONOR
P	=	LUMP SUM PURCHASE OF DME, PROSTHETICS, ORTHOTICS
Q	=	VISION ITEMS OR SERVICES
R	=	RENTAL OF DME
S	=	SURGICAL DRESSINGS OR OTHER MEDICAL SUPPLIES (EFF 04/95)

T	=	PSYCHOLOGICAL THERAPY
U	=	OCCUPATIONAL THERAPY
V	=	PNEUMOCOCCAL/FLU/HEPATITIS B VACCINE (EFF 04/95) (HEPATITIS ONLY BEFORE 04/95)
W	=	PHYSICAL THERAPY
Y	=	SECOND OPINION ON ELECTIVE SURGERY
Z	=	THIRD OPINION ON ELECTIVE SURGERY

HXR HCPCS Cross reference code

An explicit reference crosswalking a deleted code or a code that is not valid for Medicare to a valid current code (or range of codes).
Repeating element.

Standard alias: HCPCS_XREF_CD

SAS alias: XREF

IAA ICD10AM Abbreviated Descriptor

Variable length alphanumeric string with embedded punctuation.

Example:

C0024117|L0783000|S0837811|J44.9|IAA|ICD10AM|COPD unspecified|

IAC ICD10AM Australian Code

One character numeric string.

Contains a flag "1" for codes that have been exclusively developed in Australia.

IAD ICD10AM Effective from:

Variable length numeric string with embedded punctuation.

Indicates the date that the code is effective from.

Example:

1/7/98

IAH ICD10AM Age Edit, higher limit

Three character numeric string.

Minimum age is expressed as a three digit field.

Example:

Ages are represented as:

000-006: 0-6 days
 011-013: 1-3 weeks
 101-111: 1-11 months
 201-299: 1-99 years
 300- : 100+ years

IAL ICD10AM Age Edit, lower limit

Three character numeric string.

Minimum age is expressed as a three digit field.

Example:

Ages are represented as:

000-006: 0-6 days
 011-013: 1-3 weeks
 101-111: 1-11 months
 201-299: 1-99 years
 300- : 100+ years

IAN ICD10AM Annotation Note

One character string.

+ (Dagger) denotes a code describing the etiology or underlying cause of the disease

* (asterisk) denotes a code describing the manifestation of a disease

The annotations of * (asterisk) and + (dagger) indicate those disease codes in ICD-10-AM which need another code (either asterisk or dagger) to complete the diagnostic statement. Dagger codes are always sequenced before the accompanying asterisk code.

Example:

"anterior spinal and vertebral artery compression syndromes" is coded as M47.0+ (sequenced first) followed by G99.2*.

IAR ICD10AM Relationship Note

Variable length alphanumeric string with embedded punctuation.

A code embedded in the term, may have a * or +. Any embedded codes that could be mapped 1-1 were included in MRREL. All also end up in MRSAT as IAR.

Example:

C95.0

IAS ICD10AM Sex Edit

One character numeric string.

An edit flag to indicate whether the code is valid for a particular sex. Sex flags are 1 (male) or 2 (female).

IAT ICD10AM Sex Edit Type

One character numeric string.

All sex flagged codes are followed by a "sex edit type" flag. The sex edit type flags are 1 (fatal) or 2 (warning).

IAY ICD10AM Age Edit Type

One character numeric string.

All age flagged codes are followed by an age edit type flag. The age edit type flags are 1 (fatal) or 2 (warning).

ICA ICD Additional Codes Note

Variable length alphanumeric string with embedded punctuation.

An ICD-9-CM instruction to signal the coder that an additional code should be used if the information is available to provide a more complete picture of that diagnoses or procedure.

Example:

Use additional code to identify any associated silicosis(502)

ICC ICD Codes Also Note

Variable length alphanumeric string with embedded punctuation. Brackets { } may be used to indicate hierarchical information.

An ICD-9-CM instruction to signal the coder to code additional information.

Example:

Code also any synchronous debridement of brain

ICE ICD Entry Term

Variable length alphanumeric string. Brackets { } may be used to indicate hierarchical information.

An ICD-9-CM entry term.

Example:

Diarrhea:{dysenteric; epidemic}; Infectious diarrheal disease.

ICF ICD Fifth-digit Code Note

Variable length alphanumeric string with embedded punctuation. Brackets { } may be used to indicate hierarchical information.

An ICD-9-CM instruction to coders indicating use of a fifth-digit code.

Example:

The following fifth-digit subclassification is for use with category 204: {0 without mention of remission; 1 in remission}

ICN ICD Note

Variable length alphanumeric string with embedded punctuation.

An ICD-9-CM instruction providing additional coding information.

Example:

Requires fifth digit. See beginning of Section 010-018 for codes and definitions.

ICS ICD Short Form

Variable length alphanumeric string with embedded punctuation.

An ICD-9-CM 25-character version of the code.

II MeSH Indexing Information

One or more MeSH main headings or Main heading/subheading combinations.

For MeSH chemical terms (Term Type=NM), MeSH headings that may be relevant to articles that are also assigned the NM term. The information in this field helps to define the NM and suggests other related search terms.

INC ICD10AM Neoplasm code

Variable length alphanumeric string with embedded punctuation.

Example: C34.-

IPX Files linking ICPC to ICD10

A repeatable field

+ indicates that the ICD10 code is broader than the ICPC code.

- indicates that the ICD10 code is narrower than the ICPC code.

Example:

The ICPC term: L81|Other injury has one IPX value of : -S47 (S47=Crushing injury of shoulder and upper arm)

Some of the values have an "R" after the decimal point.

Example: -S93.R

IXR ICPC2E to ICD10 Cross Reference

Variable length alphanumeric string with embedded punctuation.

Example:

ICD10: Q60, Q61, Q62, Q63, Q64

JXR Cross reference from a Jablonski term to an OMIM code.

Variable length alphanumeric string with embedded punctuation.

Jablonski terms that are linked to OMIM codes.

Sample of Valid Values:

OMIM: 119600

OMIM: 104760.0009

LAC ASTM Code

A numeric string of up to eight characters that includes an embedded period.

The ASTM E1238-94 code for a test in a LOINC name.

LAL LOINC Answerlist

Variable length alphanumeric string with embedded semi-colons separating different values in the list.

Examples:

GIVEN;PARTIALLY GIVEN;DISCARDED

AUTOLOGOUS;DIRECTED DONOR;ANONYMOUS DONOR

The list of answers for results that are reportable from a multiple choice list, e.g., the answers for the term DISPOSITION OF BLOOD PACK are GIVEN;PARTIALLY GIVEN;DISCARDED.

LCA LOINC ACSSYM field

Variable length alphanumeric string with embedded punctuation.

LOINC chemical name synonyms, alternative names and chemical formulae from the Chemical Abstract Society.

LCB LOINC Chemical base name

Variable length alphanumeric string with embedded punctuation.

Chemical base name from the Chemical Abstract Society.

LCC LOINC CDC Code

Four numeric characters.

The code from the Centers for Disease Control Complexity file that maps a laboratory test to the instruments used to perform the test. The code is at the analyte level, not at the test instrument level.

LCI LOINC Molecular structure ID

The molecular structure ID, usually a Chemical Abstract Society number.

LCL LOINC Class

An alphabetic string.

Sample of valid values:

ABXBACT	Antibiotic susceptibility
ALLERGY	Response to antigens
BC	Cell counts (blood, CSF, pleuritic fluid)
BDYCRC	Body circumference
BDYHGT	Body height
BDYSURF	Body surface area
BDYTMP	Body temperature

BDYWGT	Body weight
BLDBK	Blood bank
BP	Blood pressure
BP.CENT	Blood pressure - central
BP.PSTN	Blood pressure - positional
BP.TIMED	Blood pressure - timed
BP. VENOUS	Blood pressure - venous
CELLMARK	Cell surface models
CHAL	Challenge tests
CHALSKIN	Skin challenge tests
CHEM	Chemistry
CLIN	Clinical NEC
COAG	Coagulation study
CYTO	Cytology
DRUG	Drug levels
DRUGDOSE	Drug dose (for transmitting doses for pharmacokinetics)
ED	Emergency department
EKG	Electrocardiogram
EKG.IMP	Electrocardiogram impression
EKG.MEAS	Electrocardiogram measures
EYE	Eye
FERT	Fertility

FUNCTION	Functional status (e.g. Glasgow)
H&P	History and physical
HEM	Hematology (excluding coagulation and differential count)
HEMODYN	Hemodynamics
HLA	HLA tissue typing antigens
HRTRATE	Heart rate
IO	Input/Output
MICRO	Microbiology
NEONAT	Neonatal measures
OB.US	Obstetric ultrasound
OBGYN	Obstetrics/gynecology
PATH	Pathology
RESP	Respiration
SERO	Serology (antibodies and most antigens except blood bank and infectious agents)
SKNFLD	Skinfold measurements
SURGPATH	Surgical pathology
TOX	Toxicology
UA	Urinalysis
VOLUME	Volume of specimens

An arbitrary classification of terms in LOINC designed to assist LOINC development and to group related observations together.

LCN LOINC Classtype

Valid Values:

1 = Laboratory class

2 = Clinical class

LCR LOINC Reason for Change

Variable length alphanumeric string with embedded punctuation.

Example:

CHANGED NAME -- WAS BASOPHILS/100 WBCS; CHANGED PROPERTY -- WASPCT

A brief explanation of the change made to a LOINC term.

LCS LOINC Depreciated or superseded status

Three alphabetic characters: DEL

An indicator that a LOINC term is no longer to be used. The term that should now be used will appear in the LMP element.

LCT LOINC Change Type Code

Three alphabetic characters. The type of change made to a LOINC term.

Valid Values:

ADD = Add

DEL = Delete

MAJ = Change to other subfield(s) [#2-#6] of fully-specified name

MIN = Change to any other LOINC field or attribute

NAM = Change to analyte/component, subfield #1 of fully-specified name

LDE LOINC DEEDS_CD

Variable length alphanumeric string with embedded punctuation.

Data Elements for Emergency Department Systems Codes (CDC). This field contains the DEEDS code value which maps to the LOINC code in question.

Example:

PE02000
4.20

LEA LOINC Example Answers

For some tests and measurements, LOINC has supplied examples of valid answers. These values differ from those in the ANSWERLIST field because that details possible values for nominal scale terms.

Sample of valid values:

1:64
negative @ 1:16

LEC LOINC Analyte Code

The letter A followed by five numbers.

The EUCLIDES code for the analyte which is the first subpart of the first part of a LOINC name.

LFO LOINC Formula

Regression equation details for many OB.US calculated terms.

Example:

DIAMETER.BIPARIETAL [cm] = -3.08 + 0.41 * (gestational age [wk]) - 0.000

LFR LOINC French name for term

French name for LOINC term supplied by Centre Suisse de Controle de Qualite. This field contains extended characters and will not transfer to 7-bit systems.

LGC GPI Code, GPI Code Total

For drugs, this field contains a map to the Medispan GPI codes, a hierarchical system of classifying pharmaceutical products. For a

few products, a simple one-to-one mapping with a GIP code was not possible. In these cases, all applicable GPI codes are contained in this field, separated by semicolons.

Example:

7320001010

LGR German Name for LOINC Term

Supplied by Centre Suisse de Controle de Qualite. This field contains extended characters and will not transfer correctly to 7-bit systems

Example:

Ex--Keime; ; aerobische Kultur
Ex--Keime; Routina Bakterienkultur

LIC IUPAC Code

The letters QU followed by five numbers.

The IUPAC code for the component, kind of property, and system in a LOINC name. Note that most IUPAC codes assume that the component is measured in substance concentration, e.g., moles. The IUPAC code for substance concentration is applied to mass concentration in LOINC, because IUPAC has no code for the mass concentration variant, which is more commonly used in the U.S.

LIR Italian Name for LOINC Term

Supplied by Centre Suisse de Controle de Qualite. This field contains extended characters and will not transfer correctly to 7-bit systems

Example:

isolato--amoxicillina
isolato--amoxicillina+clavulanato
isolato--amfotericina B

LIU IUPAC Analyte code

This field contains the chemical abstract service number or the enzyme nomenclature number for the chemical components for chemicals and/or enzymes. These were also contributed by IUPAC.

Example:

CAS2022-85-7

LLR LOINC Date Last Changed

YYYYMMDD

The date the LOINC term was last changed.

LMC LOINC Metpath Code

Four numeric characters.

The code that represents the LOINC name at MetPath laboratories.

LMM Molecular weights

This field contains the molecular weights of many chemical moieties when they are provided. Those added in this release were kindly contributed by IUPAC.

Example: 204.31

LMP LOINC Map to Code

A numeric string with an embedded hyphen.

The LOINC code of the term that has superseded a term with a LCS value of DEL.

LMT LOINC MULTUM_CD

Maps to Multum Inc. database of codes for drugs.

Example:
d00226

LNC LOINC NAACCR_ID

Numeric value

LOINC terms mapped to North American Association of Central Cancer Registries Identification

LNE LOINC CODE_TABLE

The characters CR followed by numbers.

Examples from Cancer Registry

CR1930
CR650

LPL LOINC Panel Elements

Alphanumeric text, repeating field, separated by ';'.
List of individual tests that comprise a panel.

Example: "CHLORIDE;POTASSIUM;SODIUM"

LQS Survey Question Source

Exact name of the survey instrument and the item/question number.

Example:

HOME HEALTH CARE CLASSIFICATION O38.1
HOME HEALTH CARE CLASSIFICATION A01.0

LQT Survey Question Text

Verbatim question from the survey instrument.

Example:

LIVING WITH HIV/AIDS -I MAY CHOOSE TO SELF-DELIVER (SUICIDE) NEAR THE END
LIVING WITH HIV/AIDS -I HAVE A MEANINGFUL LIFE
LIVING WITH HIV/AIDS -MY MEDICINES ARE TAKING OVER MY LIFE

LRF Reference

Contains references to medical literature, product announcements, or other written sources of information on the test or measurement

described by the LOINC record.

LRN LOINC related name

Previously was released as a RN string from LOINC. This term type was converted to an attribute in 2002AC.

Examples:

LRN|LNC205|PIVMECILLIAM;SELEXID;AMDINOCILLIN PIVOXIL

LRN|LNC205|AMIKIN;

LRN|LNC205|AMIKIN;KIRBY-BAUER

LRN|LNC205|AMIKIN;

LSC LOINC SNOMED Code

An alphabetic character followed by numeric characters and an embedded hyphen.

The code for a SNOMED International laboratory procedure name that is related to (usually broader than) the LOINC term.

LSP LOINC Species code

2 alphabetic characters.

Codes detailing which non-human species a term applies to. If there is no code, human is assumed.

LSR Root of a set of LOINC codes

Currently used for claims attachments.

Yes in this field signifies that this record is the root of a set of LOINC codes.

LT Lexical Tag

*NOTE: This attribute was present in older versions of the Metathesaurus It was discontinued but has been brought back starting with 2002AD.

Indicates if a chemicals or medical device is a tradename.

Valid Value: TRD

LUN LOINC Typical Units

Alphanumeric string with embedded slash.

Example: KIU/L

The typical units in which the observation is recorded.

LUR Units required when used as OBX segment

Y/N field that indicates that units are required when this LOINC is included as an OBX segment in a HIPAA attachment

MDA MeSH date of entry

YYYYMMDD

The date the term was added to the MeSH file, which is prior to the date the term became available for indexing and searching MEDLARS citations. Terms that have been part of MeSH for many years may have no value in this element.

MEA In NOC, the "measurement scale" used for a particular outcome.

Example:

9: None - Limited - Moderate - Substantial - Extensive

MED##### (MEDLINE Backfile Postings 1910 through 2003 (MeSH only))

'MED' followed by a numeric value followed by another numeric value preceded by an asterisk (*); one of the two values may be absent, indicating no occurrences.

Data elements which give the number of times a MeSH term has been used in MEDLINE, by year on the NLM system. For MeSH main headings, each element has two values: the total occurrences and the occurrences in which the term was designated a principal concept, preceded by an asterisk. For subheadings, only the total postings are given. These attributes have a SAB of NLM-MED.

This is the only source of information in the Metathesaurus on the frequency of use of MeSH headings in MEDLINE from 1910 and on the total frequency of use of MeSH headings in MEDLINE from 1966 to present.

MISO MedDRA Serial Code International SOC Sort Order Digit (01-26)

Examples:

MISO|07
MISO|05
MISO|09
MISO|14

MISO|11

MMR MeSH revision date

YYYYMMDD

The date of the last major revision to the term's MeSH record.

MN MeSH Tree Number

Repeating element. Variable length alphanumeric string with embedded periods.

The hierarchical number for the concept in the MeSH tree structures. This number also appears in the HCD subelement of the REL and CXT elements.

MPS MedDRA primary SOC

MedDRA PTs may have multiple tree positions but each has a primary SOC

Examples:

MPS|MDR|10017947

MPS|MDR|10017947

MPS|MDR|10022117

MPS|MDR|10017956

MR Major revision date

YYYYMMDD

The date the Metathesaurus entry for the concept underwent any revision in content.

MSA MedDRA abbreviation (either SOC or Special Search Category)

Examples:

MSA|MDR|Eye

MSA|MDR|Gastr

MSA|MDR|Card

MSA|MDR|HMRG

MSC Minimal Standard (Terminology) Class

A variable length character string with embedded punctuation.

Example:

Reason.Term
Site.Term
Procedure.Attribute.Value

MSP SPN Medical Specialty Panel

2 alphabetic characters.

Medical Specialty Panel (responsible for reviewing the product).

MUI MeSH Unique Identifier

8 char Text field with leading 'M'.

The MUI is a MeSH Unique Identifier assigned by NLM. Each concept in MeSH is given a MUI.

Example: M0001333

MXR MedDRA cross reference to WHOART, COSTART or ICD9CM

Examples:

MXR|MDR|J-ART: 1254
MXR|MDR|WHOART: 0268015
MXR|MDR|COSTART: ABDO SYND ACUTE
MXR|MDR|HARTS: 10
MXR|MDR|COSTART: ABDO SYND ACUTE

NA Neuronames Abbreviation

One or more alphabetic characters

A short abbreviation for a concept name in the Neuronames thesaurus.

NAF NIC atoms

The complete text of the NIC full intervention, in cases where the NIC term in the "STR" field of MRCON has been trimmed from its original form (due to length or to extraneous information at the end of the text).

SA (the trimmed version) and AL (the full version) always stay together.

Examples:

44301016 | NIC | NIC/AL | U001016 | Assist with fetal diagnostic procedures (e.g., amniocentesis, chorionic villus sampling, percutaneous umbilical blood sampling, and Doppler blood flow studies)

443086932 | NIC | NIC/SA |U001016 | Assist with fetal diagnostic procedures

44306769|NIC|NIC/AL|U006769|Provide community resource information to elder patients and their caretakers, including addresses and phone numbers of agencies that provide senior service assistance; health, home health, residential, respite, and emergency care; housing assistance; transportation; substance abuse treatment; sliding-fee counseling services; food pantries and Meals on Wheels; clothing distribution centers; human services; and hot lines

44308999|NIC|NIC/SA|U006769|Provide community resource information to elder patients and their caretakers

NAT Neuronames Anatomy Type

A single character.

Valid Values:

S superficial
V volumetric

An indication of the type of anatomy represented by a Neuronames concept name.

NDC National Drug Code

National Drug Code corresponding to a clinical drug

Examples: NDC|MTHFDA|66109- ABD-00
 NDC|MTHFDA|66528- ABC-00

NFI National formulary indicator

Alphabetic characters.

Valid Values:

"YES" or "NO" indicating whether a drug is in the VA's National Formulary

NH NonHuman Flag

A single character: Y.

An indication that the concept does not apply to human beings, used only when the concept's Semantic type(s) could imply the contrary. For example, the concept BEAK and CLAW are assigned the Semantic type "Body Part, Organ, or Organ Component", but do not apply to human beings. Concepts do not carry the non human flag if their semantic types are obviously nonhuman (e.g., "Medical Device", "Hazardous or Poisonous Substance"). This element can indicate when special search restrictions are appropriate or that a concept may be inappropriate to the user's search.

STY's of concepts eligible to receive the non-human flag are:

1. Anything in the Anatomical Structure Tree, e.g., horn
2. Anything in the Behavior Group, e.g., rutting
3. Anything in the Natural Phenomenon or Process Tree, e.g., glanders

NSR Neuronames Species Restriction

A single character.

Valid Values:

H human only
M macaque only

An indication that a Neuronames concept applies only to humans or only to macaques. Most Neuronames concepts apply to both and have no species restriction.

NST Normalized strength

Normalized strength and units (for drugs with one active ingredient)

Examples: NST|MTHFDA|769 MG
 NST|MTHFDA|8 MEQ
 NST|MTHFDA|8 MG

OL MeSH Online Note

Variable length alphanumeric string with punctuation.

Information helpful to online searchers of MEDLINE, especially when the history of a term or cross-reference has implications for online searching. This is a potential source of useful information for rules for search interface programs.

ORIG_CODE Original code of the string

Variable length characters.

This is an attribute attached to RXNORM strings that was created to prevent a string from an old version of a drug source from disappearing. ORIG_CODE is the original code of the string.

Examples:

ORIG_CODE|RXNORM|06436

ORIG_CODE|RXNORM|06470

ORIG_SOURCE Original source of the string

Variable length characters.

This is an attribute attached to RXNORM strings that was created to prevent a string from an old version of a drug source from disappearing. ORIG_SOURCE is the original source of the string.

Examples:

ORIG_SOURCE|RXNORM|MDDDB99

ORIG_SOURCE|RXNORM|MDDDB99

PA MeSH Pharmacologic Action

The pharmacologic action of MeSH main headings (MH) for drugs and supplementary concept names (NM). The information in this element is also represented by an "isa" relationship between the MH or NM concept and the MeSH concept name for the class of drugs with a particular pharmacologic action.

PCD PDQ Closest Related Clinical Diagnoses

Used for disease terms only.

The closest related clinical diagnosis is provided for disease terms to permit the identification of the closest diagnosis for which an entire treatment statement can be found in PDQ.

Example:

AIDS-related lymphoma

PCL Pharmacy Practice Activity Classification (PPAC) Category

All terms are assigned to one of five categories, which connote their hierarchy.

Valid Values:

Activity
Class
Domain
Step
Task

PDA PDQ Short Name or Abbreviation

An alphanumeric string with embedded blanks.

An abbreviated name for a PDQ concept.

PDC SPN Product Device Class

1 numeric character.

Product Device Class (level of CDRH regulation: class 1, 2, or 3).

PI MeSH Previous Indexing

Repeating element.

MeSH heading or heading/subheading combination(s) followed by a date range in parentheses (YYYY).

The MeSH headings or main heading/subheading combination that may be used to search for MEDLINE citations indexed before the concept was introduced into MeSH. Each entry is followed by a year or range of years as a guide to the period when the term in the PI field should be searched. The appropriate Boolean logic for the PI terms is not provided. The searcher must make the decision whether to AND or OR the terms supplied when multiple terms are present.

PLR Pharmacy Practice Activity Classification (PPAC) Last Revision Date

Format: M/DD/YY time

Example:
1/15/98 0:00:00

PM Public MeSH note

Variable length alphanumeric.

Combines key information from the HN and PI elements in a format that is printed in the MeSH publications.

PRC Product Third Party Review Code

1 alphabetic character.

Third party review code from SPN.

PRN VANDF Print/Label Name

Examples:

PRN|VANDF|CASTOR OIL
 PRN|VANDF|COD LIVER OIL
 PRN|VANDF|CORN STARCH TOP PWD
 PRN|VANDF|IPECAC SYRUP
 PRN|VANDF|ARTIFICIAL SALIVA

PTR SPN Product Tier

1 alphabetic or numeric character.

Product Tier (level of CDRH triage: 1, 2, 3, or E{xempt}).

PXC PDQ Protocol Exclusion Criteria

Terms with type "exclusion criteria," which may be indexed on protocol records to identify conditions that exclude a patient from eligibility.

Example:

active peptic ulcer disease/GI bleeding

PYR PsychInfo year designation

4-digit year

Example: 1973

QA MeSH Topical Qualifier Abbreviation

Two alphabetic characters.

For MeSH subheadings (Term Type=TQ), an abbreviation that may be used in place of the full text of the abbreviation in searching on NLM's system and possibly on other systems offering NLM data.

QE MeSH Qualifier Entry Version

Variable length alphabetic string

A short form for a MeSH qualifier.

QS MeSH Qualifier Sort Version

Alphabetic string.

The form of the subheading needed for proper alphabetic sequencing when the subheading cannot be sequenced properly by the sort algorithms used in the MeSH publications.

RANK NCBI Rank

Variable length characters.

Attribute was added for NCBI2003 to represent the assigned rank.

Examples:

RANK|NCBI|species
RANK|NCBI|genus

REF A list of bibliographic citations related to a given nursing intervention or nursing outcome.

Example:

Glick, O.J. (1992), Interventions related to activity and movement. In G.M. Bulechek & J.C. McCloskey (Eds.), Symposium on Nursing Interventions. Nursing Clinics of North America, 27 (2), 541-568.; Lewis, C. B. (1989). Improving mobility in older persons. Rockville, MD: Aspen.; Sheahan, S. (1982). Assessment of low back pain. Nurse Practitioner, 7 15-23.; Sweezey, S. (1988), Low back pain. Geriatrics, 43(2), 39-44.

RID Read Codes Term_id

An identifier assigned to a Read term, used in referring to the term in the Read file structure, and may be used in clinical information systems.

RN Registry Number

A series of numbers and hyphens (any leading zeros in an RN are dropped) or a series of numbers and periods, preceded by EC

The Chemical Abstracts Service Registry number for a chemical or the Enzyme Commission number for an enzyme. (See also EZ.) This number is an alias for the concept name and can be used to retrieve information about the concept from a number of chemical and toxicological databases.

RR Related Registry Number

Repeating element; with two subelements.

Registry number (Relationship to concept in parentheses).

Example:

80551640 (sulfate)

The Chemical Abstracts Registry numbers for salts, optical isomers, or isotope-labeled versions of the concept followed by the relationship of this RR to the RN (in parentheses.) Applies to chemicals only. These numbers can be used as links to information in a number of chemical and toxicological databases.

RXO Drug Description from NDF

Single Character.

R for Rx and O for OTC

SB SNOMED International subset indicator

A one or two character code including letters and/or an asterisk.

Valid Values:

* can code using two T codes or G code for laterality B Bethesda system (Morphology)

- IC ICDO (Oncology) related
- N Nursing
- N* Nursing, provisional
- U Ultrastructure (Morphology)
- V Veterinary
- V* Veterinary AND can code using two T codes or G code for laterality (Topography)

A tag indicating that a SNOMED International term belongs to one of a number of special categories.

SHF SNOMED Hospital Formulary Code.

A numeric string that includes colons and periods.

Example:

84:24:12

The American Hospital Formulary Code for a chemical contained in SNOMED International.

SIC SNOMED ICD9CM Reference

Repeating element; a numeric string which may have embedded periods.

The ICD9CM code or codes listed as relevant to the meaning of the concept in SNOMED International. The information contained in this element is also represented as SNMI-specific "mapped_to" relationships between Metathesaurus concepts in the MRREL file.

SID Secondary GO ID

Examples: SID|GO|GO:0020034
SID|GO|GO:0016196

SMX SNOMED Multiaxial coding

An alphanumeric string that includes hyphens, parentheses, and sometimes ellipses.

Additional SNOMED International codes or truncated codes that cover aspects of the SNOMED International concept to which they are attached.

SOS Scope Statement

Two subelements:

1. Abbreviation of the source of the statement
2. Variable length string with alpha character, punctuation, and in some cases diacritics

Details about the scope of a concept in a particular source vocabulary. The Metathesaurus contains scope statements from a number of source vocabularies.

SRC MeSH Literature source of chemical name

Variable length alphanumeric string.

A citation to an article in a journal indexed for MEDLINE in which the chemical has been identified.

Note: Not to be confused with source abbreviation of SRC.

ST Concept Attributes Status

One alpha character

Valid Values:

R Reviewed

U Unreviewed

The review status of the concept attributes. If human review of the concept attributes has been completed, the status is R. If human review has not been completed, the status is U.

All concepts in the current release are reviewed, so there are no Unreviewed cases.

Note: In prior releases of the Metathesaurus, some concepts (primarily MeSH Supplementary Concepts) were "Unreviewed" because they were not reviewed as concepts for the Metathesaurus. All have been reviewed as concepts for the current release.

Similarly, some interconcept relationships derived from the Supplementary Concepts were not reviewed again for the Metathesaurus; these relationships carried the "Machine-generated and unverified indicator" (MG, value G). All relationships have been reviewed for

the current release.

SWP Swiss Protein Number

Numeric value

TH MeSH Thesaurus ID

Repeating element. Alphanumeric string.

Identifies thesauri other than MeSH in which the MeSH heading or cross-reference is included.

TRN Trade Name of Product

Alphabetic characters.

TYPE Multum Medical Supply Category

Variable length alphabetic string.

Sample of Valid Values:

natural supplements
wound care supplies

UWT A semantic type provided from terms from the University of Washington Digital Anatomist

Repeating element.

Actual values:

Anatomical entity

Anatomical feature

Anatomical junction

Anatomical spatial entity

Anatomical structure

Body part

Body space

Body substance

Cell

Conceptual anatomical entity

Organ

Organ part

Organ system

Organ system subdivision

Physical anatomical entity

Tissue

VAC VA Class

The code of an NDF/HT drug class name.

Example:

COD LIVER OIL (CHERRY FLAVOR)
COD LIVER OIL, MINT FLAVORED

VID Health Level Seven Vocabulary ID

The numeric HL7 ID for an HL7/PT string.

Example:

1907

VMO VA CMOP (central mail-order pharmacy) ID

Alphanumeric string.

Example:

T0344
H0281

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B.2. Vocabulary Source Abbreviations

Complete list of Source Abbreviations for 2003AC. Note that both the root and versioned source abbreviations are now included. For more information on source contact information, please see [Section A.1](#) in the documentation.

Root SAB	Versioned SAB	Full Source Name and Version
AIR	AIR93	AI/RHEUM, 1993.
ALT	ALT2003	Alternative Billing Concepts (AltLink), 2003.
AOD	AOD2000	Alcohol and Other Drug Thesaurus: A Guide to Concepts and Terminology in Substance Abuse and Addiction. 3rd ed., 2000.
BI	BI98	Beth Israel OMR Clinical Problem List Vocabulary, Version 1.0, 1999.
BRMP	BRMP2003	Descritores em Ciencias da Saude [Portuguese translation of MeSH], 2003.
BRMS	BRMS2003	Descritores en Ciencias de la Salud [Spanish translation of MeSH], 2003.
CCPSS	CCPSS99	Canonical Clinical Problem Statement System, Version 1.0, 1999.
CCS	CCS2003	Clinical Classifications Software, February 2003.
CDT	CDT4	Current Dental Terminology (CDT) contained in the HCFA Common Procedure Coding System (HCPCS), Version 4, 2003.
COSTAR	COSTAR_89-95	Computer-Stored Ambulatory Records, 1989, 1992, 1993, 1995.
CPM	CPM2003	Columbia Presbyterian Medical Center Medical Entities Dictionary, 2003.
CPT	CPT2003	Physicians' Current Procedural Terminology, 4th ed., 2003.
CPTSP	CPT01SP	Current Procedural Terminology (CPT), Spanish Translation, 4th ed., 2003.
CSP	CSP2003	Computer Retrieval of Information on Scientific Projects, 2003.
CST	CST95	Coding Symbols for Thesaurus of Adverse Reaction Terms, 5th ed., 1995.
DDB	DDB00	Diseases Database, 2000.
DMD	DMD2003	German translation of MeSH, 2003.
DMDICD10	DMDICD10_1995	Internationale Klassifikation der Krankheiten 10 [German translation of ICD10], 1998.
DMDUMD	DMDUMD_1996	Die Nomenklatur fuer Medizinprodukte UMDNS [German translation of UMDNS], 2000.
DSM3R	DSM3R_1987	Diagnostic and Statistical Manual of Mental Disorders, 3rd ed. rev., 1987.
DSM4	DSM4_1994	Diagnostic and Statistical Manual of Mental Disorders, 1994.
DUT	DUT2003	Nederlandse vertaling van Mesh (Dutch translation of MeSH), 2003.
DXP	DXP94	DXplain (An expert diagnosis program).
FIN	FIN2003	Finnish translation of MeSH, 2003.
GO	GO2002_12_16	Gene Ontology, 2000.
HCDT	HCDT4	HCPCS Version of Current Dental Terminology (CDT), Version 4, 2003.
HCPCS	HCPCS03	Healthcare Financing Administration Common Procedure Coding System, 2003.

HCPT	HCPT03	HCPCS Version of Current Procedural Terminology (CPT), 2003.
HHC	HHC2003	Home Health Care Classification of Nursing Diagnoses and Interventions, 2003.
HL7	HL7_1998-2002	Health Level Seven Vocabulary (HL7), 1998.
ICD10	ICD10_1998	International Statistical Classification of Diseases and Related Health Problems, 10th rev, 1998.
ICD10AE	ICD10AE_1998	International Statistical Classification of Diseases and Related Health Problems, 10th rev, 1998.
ICD10AM	ICD10AM_2000	International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification, 2nd Edition, January 2000.
ICD9CM	ICD9CM_2004	The International Classification of Diseases, 9th revision, Clinical Modification, July 2003.
ICPC	ICPC93	The International Classification of Primary Care (ICPC), 1993.
ICPC2E	ICPC2E_1998	International Classification of Primary Care (ICPC) / prepared by the Classification Committee of the World Organization of National Colleges, Academies, and Academic Associations of General Practitioners/Family Physicians (WONCA), known more briefly as the World Organization of Family Doctors, 2nd ed., 1998.
ICPC2AE	ICPC2AE_1998	American English equivalent of the ICPC2E terms, produced by NLM, 2nd edition, 1998.
ICPC2P	ICPC2P_2000	International Classification of Primary Care, Version 2-Plus, Australian Modification, January 2000.
ICPCPAE	ICPCPAE_2000	American English equivalent of the ICPC2P terms, produced by NLM, Version 2-Plus, January 2000.
ICPCBAQ	ICPCBAQ_1993	Basque translation of ICPC93; see ICPC93
ICPCDAN	ICPCDAN_1993	Danish translation of ICPC93; see ICPC93
ICPCDUT	ICPCDUT_1993	Dutch translation of ICPC93; see ICPC93
ICPCFIN	ICPCFIN_1993	Finnish translation of ICPC93; see ICPC93
ICPCFRE	ICPCFRE_1993	French translation of ICPC93; see ICPC93
ICPCGER	ICPCGER_1993	German translation of ICPC93; see ICPC93
ICPCHEB	ICPCHEB_1993	Hebrew translation of ICPC93; see ICPC93
ICPCHUN	ICPCHUN_1993	Hungarian translation of ICPC93; see ICPC93
ICPCITA	ICPCITA_1993	Italian translation of ICPC93; see ICPC93
ICPCNOR	ICPCNOR_1993	Norwegian translation of ICPC93; see ICPC93
ICPCPOR	ICPCPOR_1993	Portuguese translation of ICPC93; see ICPC93
ICPCSPA	ICPCSPA_1993	Spanish translation of ICPC93; see ICPC93
ICPCSWE	ICPCSWE_1993	Swedish translation of ICPC93; see ICPC93
INS	INS2003	Thesaurus Biomedical Francais/Anglais [French translation of MeSH], 2003.
ITA	ITA2003	Italian translation of MeSH, 2003.
JABL	JABL99	Online Congenital Multiple Anomaly/Mental Retardation Syndromes, 1999.
LCH	LCH90	Library of Congress Subject Headings, 12th ed., 1989.
LNC	LNC208	Logical Observation Identifiers, Names and Codes, Version 2.08, 2003.
MCM	MCM92	Glossary of Methodologic Terms for Clinical Epidemiologic Studies of Human Disorders.
MDDB	MDDB_2003_03	Master Drug DataBase (MDDB), 2003.
MDR	MDR60	Medical Dictionary for Regulatory Activities Terminology (MedDRA), Version 6.0, March 2003.
MDRAE	MDRAE60	Medical Dictionary for Regulatory Activities Terminology (MedDRA), American English Equivalents, Version 6.0, March 2003.
MDREA	MDREA60	Medical Dictionary for Regulatory Activities Terminology (MedDRA), American English, with expanded abbreviations, Version 6.0, March 2003.

MDREX	MDREX60	Medical Dictionary for Regulatory Activities Terminology (MedDRA),with expanded abbreviations, Version 6.0, March 2003.
MDRPOR	MDRPOR60	Medical Dictionary for Regulatory Activities Terminology (MedDRA),with expanded abbreviations, Version 6.0, Portuguese Edition, March 2003.
MDRSPA	MDRSPA60rev	Medical Dictionary for Regulatory Activities Terminology (MedDRA),with expanded abbreviations, Version 6.0 revision, Spanish Edition, June 2003.
MIM	MIM93	Online Mendelian Inheritance in Man, 1994.
MMSL	MMSL_2003_03	Multum Drug Source Lexicon, March 2003.
MMX	MMX01	Micromedex DRUGDEX, 2001.
MSH	MSH_2004_2003_08_08	Medical Subject Headings, August 8, 2003.
MTH	MTH	UMLS Metathesaurus.
MTHCH	MTHCH03	Metathesaurus Hierarchical CPT Terms (These terms were created by the NLM to provide contextual information for CPT).
MTHFDA	MTHFDA_2003_01	FDA National Drug Code Directory, 2003.
MTHHH	MTHHH03	Metathesaurus Hierarchical HCPCS Terms (These terms were created by the NLM to provide contextual information for HCPCS).
MTHICD9	MTHICD9_2004	NLM-generated entry terms for ICD-9.
MTHMST	MTHMST2001	Metathesaurus Version of Minimal Standard Terminology Digestive Endoscopy, International Edition, April 22 1998.
MTHMSTFRE	MTHMSTFRE_2001	Metathesaurus Version of Minimal Standard Terminology Digestive Endoscopy, French Edition, April 22 1998.
MTHMSTITA	MTHMSTITA_2001	Metathesaurus Version of Minimal Standard Terminology Digestive Endoscopy, Italian Edition, April 22 1998.
NAN	NAN99	Classification of Nursing Diagnoses: Proceedings of the 10th conference, 1999.
NCBI	NCBI2003	NCBI Taxonomy, 2003.
NCI	NCI2001a	NCI Thesaurus, Version 3.0, July 2001.
NDDF	NDDF01	National Drug Data File, 2001.
NEU	NEU99	Neuronames Brain Hierarchy, 1999.
NIC	NIC99	Nursing Interventions Classification, 1999.
NOC	NOC97	Nursing Outcomes Classification, 1997.
OMS	OMS94	The Omaha System: Applications for Community Health Nursing, 1992 (with 1994 corrections).
PCDS	PCDS97	Patient Care Data Set, Version 4.0, 1998.
PDQ	PDQ2002	Physician Data Query Online System, July 1 2002.
PPAC	PPAC98	Pharmacy Practice Activity Classification (PPAC), January 1998.
PSY	PSY2001	Thesaurus of Psychological Index Terms, Ninth edition, 2001.
QMR	QMR96	Quick Medical Reference, 1997.
RAM	RAM99	Randolph A. Miller Clinically Related Concepts, 1999.
RCD	RCD99	Clinical Terms, Version 3 (Read Codes) (Q199), March 1999.
RCDAE	RCDAE_1999	American English equivalent of the Read Thesaurus terms produced by NLM, Version 3 (Q199), 1999.
RCDSA	RCDSA_1999	American English equivalent of synthesized terms from the Read Thesaurus produced by NLM, Version 3 (Q199), 1999.
RCDSY	RCDSY_1999	Synthesized Read terms (without initial bracketed letters) of the Read Thesaurus produced by NLM, Version 3 (Q199), 1999.
RUS	RUS2003	Russian Translation of MeSH, 2003.
RXNORM	RXNORM_03AC	RxNorm work done by the National Library of Medicine (NLM), META2003AC release.

SNM	SNM2	Systematized nomenclature of medicine, 2nd ed, 1979. SNOMED update, 1982.
SNMI	SNMI98	Systematized Nomenclature of Human and Veterinary Medicine: SNOMED International, Version 3.5, 1998.
SPN	SPN02	Standard Product Nomenclature, 2002.
SRC	SRC	UMLS Metathesaurus Source Terminologies.
ULT	ULT93	Ultrasound Structured Attribute Reporting, 1993.
UMD	UMD2003	Universal Medical Device Nomenclature System, 2002.
UWDA	UWDA173	University of Washington Digital Anatomist, v. 1.7.3, March 2003.
VANDF	VANDF03	Veterans Health Administration National Drug File, March 13, 2003.
WHO	WHO97	WHO Adverse Drug Reaction Terminology, 1997.
WHOFRE	WHOFRE_1997	French translation of WHO97; see WHO97
WHOGER	WHOGER_1997	German translation of WHO97; see WHO97
WHOPOR	WHOPOR_1997	Portuguese translation of WHO97; see WHO97
WHOSPA	WHOSPA_1997	Spanish translation of WHO97; see WHO97

B.2.1 Sources of additional (non-concept name) information

A small number of sources contribute information to the Metathesaurus but do not contribute concept names (i.e., the SAB does not appear in MRSO). For example, a source may contribute relationships between concepts, but not actually name the concepts. The following versioned and versionless SABs do not appear in MRSO:

HDA	HDA99	Health Devices Alerts. Plymouth Meeting, PA: ECRI.
HLREL	HLREL_1998	ICPC2E-ICD10 relationships from Dr. Henk Lamberts (HLREL). University of Amsterdam. Contact: H.Lamberts@AMC.UVA.NL.
HPC	HPC99	Healthcare Product Comparison System. Plymouth Meeting, PA: ECRI.
MBD	MBD03	MEDLINE (1993-1997)
MED	MED03	MEDLINE (1998-2003)
NCISEER	NCISEER_1999	NCI Surveillance, Epidemiology, and End Results (SEER) conversions between ICD-9-CM and ICD-10 neoplasm codes. National Cancer Institute, Bethesda, MD. Release Date: June 1999.
NLM-MED	NLM-MED	National Library of Medicine (NLM). Bethesda (MD): National Library of Medicine.
OMIM	OMIM97	Online Mendelian Inheritance in Man (OMIM). Bethesda (MD): National Center for Biotechnology Information, 1997. Contact: http://www3.ncbi.nlm.nih.gov/Omim .

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B.3 Number of Strings From Each Source

Root SAB	Count
AIR	685
ALT	6575
AOD	20685
BI	1251

BRMP	46986
BRMS	43709
CCPSS	15840
CCS	1611
CDT	560
COSTAR	3461
CPM	3099
CPTSP	7865
CPT	16564
CSP	20629
CST	6444
DDB	256
DMD	51235
DMDICD10	12003
DMDUMD	4415
DSM3R	467
DSM4	490
DUT	38482
DXP	10113
FIN	21594
GO	20514
HCDT	560

HCPCS	5091
HCPT	8486
HHC	411
HL7	615
ICD10	13505
ICD10AE	1107
ICD10AM	25891
ICDAMA	2405
ICD9CM	20200
ICPC	1053
ICPC2AE	210
ICPC2E	3757
ICPC2P	13383
ICPCBAQ	695
ICPCDAN	723
ICPCDUT	723
ICPCFIN	722
ICPCFRE	723
ICPCGER	723
ICPCHEB	485
ICPCHUN	718
ICPCITA	723
ICPCNOR	722

ICPCPAE	901
ICPCPOR	723
ICPCSPA	723
ICPCSWE	723
INS	32552
ITA	22529
JABL	3260
LCH	6652
LNC	106695
MCM	43
MDDB	9448
MDR	76954
MDRAE	818
MDREA	16
MDREX	454
MDRPOR	18394
MDRSPA	62027
MIM	250
MMSL	41810
MMX	11536
MSH	523286
MTH	42358
MTHCH	908
MTHFDA	43920
MTHHH	322

MTHICD9	18580
MTHMST	1945
MTHMSTFRE	1833
MTHMSTITA	1799
NAN	169
NCBI	183615
NCI	2276
NDDF	20088
NEU	3865
NIC	10187
NOC	3056
OMS	539
PCDS	2229
PDQ	19624
PPAC	380
PSY	7671
QMR	943
RAM	258
RCD	347568
RCDAE	17315
RCDSA	1185
RCDSY	22186

RUS	44768
RXNORM	104000
SNM	44274
SNMI	164179
SPN	5064
SRC	689
ULT	84
UMD	15684
UWDA	92913
VANDF	15625
WHO	3831
WHOFRE	3717
WHOGER	3402
WHOPOR	3751
WHOSPA	3106

Total Counts

Concepts:	975,354
Terms:	2,026,145
Strings:	2,361,983
Source Strings:	2,638,864

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B.4 Types of Names in a Vocabulary - the TTY

NOTE: In the following list, "term" is used to mean a name; all types of concept names are strings. This contrasts with the Metathesaurus® definition of "term", which is the group of all strings that are lexical variants of each other.

AA	Attribute type abbreviation
AB	Abbreviation in any source vocabulary
AC	Activities
AD	Adjective
AS	Attribute type synonym
AT	Attribute type
BD	Fully-specified drug brand name that can be prescribed
BN	Fully-specified drug brand name that can not be prescribed
CC	Trimmed ICPC component process
CD	Clinical Drug
CE	Entry "term" to a Supplementary Concept "term"
CL	Class
CMN	Common name
CN	LOINC official component name
CO	ICPC component names (these are hierarchical "terms", as opposed to the LOINC component names which are analytes)
CP	ICPC component process (in original form)
CS	Short component process in ICPC, i.e. include some abbreviations
CX	Component process in ICPC with abbreviations expanded
DE	Descriptor
DF	Dose Form

DFA	Dose Form Abbreviation
DI	Disease name
DO	Domain
DS	Short form of descriptor
DT	Definitional "term", present in the Metathesaurus because of its connection to a Dorland's definition or to a definition created especially for the Metathesaurus
DX	Diagnosis
EN	MeSH nonprint entry "term"
EP	Entry "term"
EQ	Equivalent name
ES	Short form of entry "term"
ET	Entry "term"
EX	Expanded form of entry "term"
FI	Finding name
FN	Full form of descriptor
GN	Generic drug name
GO	Goal
GT	Glossary "term"
HC	Hierarchical class
HG	High Level Group "Term"
HS	Short hierarchical "term" (needed expansion) in ICD 10
HT	Hierarchical "term"
HX	Expanded version of short hierarchical "term"

ID	Nursing indicator
IN	Ingredient
IS	Obsolete synonym
IT	Index "term", i.e., derived from the index to any non-MeSH source vocabulary
IX	Expanded forms of indicators (embedded abbreviations expanded)
IV	Intervention
LN	LOINC official fully specified name
LO	Obsolete official fully specified name
LS	Expanded system/sample type (The expanded version was created for the Metathesaurus and includes the full name of some abbreviations.)
LT	Lower Level "Term"
LX	Official fully specified name with expanded abbreviations
MD	CCS multi-level diagnosis categories
MH	Main heading
MM	Metathesaurus string created to distinguish different meanings of the same lexical string
MP	Preferred names of modifiers
MS	Multum names of branded and generic supplies or supplements
MT	An alternate form of a concept name from one of the source vocabularies created for the Metathesaurus
MV	Multi-level procedure category
NM	Supplementary chemical "term", a name of a substance
NP	Non-preferred "term"
NS	Short form of non-preferred "term"
NX	Expanded form of non-preferred "term"

N1	Chemical Abstracts Service Type 1 name of a chemical
OA	Obsolete abbreviation
OC	Nursing outcomes
OL	Non-current Lower Level "Term"
OM	Obsolete modifiers in HCPCS
OP	Obsolete preferred "term"
OR	Orders
OS	System-organ class in the WHO Adverse Reaction Terminology
OSN	Official short name
PC	Preferred "trimmed term" in ICPC
PCN	Preferred common name
PM	Machine permutation
PN	Metathesaurus preferred name
PQ	Qualifier for a problem
PR	Name of a problem
PS	Short forms that needed full specification
PT	Designated preferred name
PX	Expanded preferred "terms" (pair with PS)
RAB	SRC root abbreviation
RHT	SRC root hierarchical term
RPT	SRC root preferred term
RS	Extracted related names in SNOMED2
RSY	SRC root synonym
RT	Designated related "term"
SA	Short forms of activities

SBD	Semantic branded drug
SC	Special Category term
SCD	Semantic Clinical Drug
SCDC	Semantic Drug Component
SCN	Scientific name
SD	CCS single-level diagnosis categories
SF	Synonym made by replacing ";" with no spaces around it with ", " in ICPCP2
SI	Name of a sign or symptom of a problem
SN	Official component synonym in LOINC
SP	CCS single-level procedure categories
SS	Synonymous "short" forms
SSN	SRC short source name used in the UMLS Knowledge Source Server
ST	Step
SX	Mixed-case component synonym with expanded abbreviations
SY	Designated synonym
TA	Task
TC	"Term" class
TG	Name of the target of an intervention
TQ	Topical qualifier
TX	CCPSS synthesized problems for TC Term Type
UCN	Unique common name
UPC	Unique preferred common name
USN	Unique scientific name
USY	Unique synonym
VAB	SRC versioned abbreviation
VPT	SRC versioned preferred name

VS	Value Set
VSY	SRC versioned synonym
XD	Expanded descriptor in AOD
XQ	Alternate name for a qualifier
XX	Expanded string

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B.5 Order of Precedence of Source Concept Names as Distributed

NOTE: MTH|PN names always receive the highest ranking within a concept. After that, the ranking of an MTH|MM immediately precedes the highest ranking Source|Term Type of the ambiguous string that caused it to be created. Also, please note that users are encouraged to change precedence to suit their own preferences.

The Metathesaurus® file MRRANK contains this information which can be used to change precedence to suit your needs. MetamorphoSys may be used to change Precedence order also.

MTH/PN
 MTH/MM
 MSH/MH
 MSH/TQ
 MSH/EP
 MSH/EN
 MSH/XQ
 MSH/NM
 RXNORM/SCD
 RXNORM/SBD
 RXNORM/SY
 RXNORM/OCD
 RXNORM/OBD
 RXNORM/SCDF
 RXNORM/SBDF
 RXNORM/SCDC
 DSM4/PT
 DSM3R/PT
 SNMI/PT
 SNMI/PX
 SNMI/HT
 SNMI/HX
 VANDF/CD
 VANDF/HT
 VANDF/IN
 MDDB/CD
 MMX/CD
 MMX/IN
 RCDSA/PT
 RCDSY/PT
 RCDAE/PT
 RCD/PT

MSH/N1
MSH/CE
RXNORM/BN
RXNORM/IN
RCDSA/OP
RCDSY/OP
RCDAE/OP
RCD/OP
SNM/PT
SNMI/RT
SNM/RT
SNMI/SY
SNMI/SX
RCDSA/SY
RCDSY/SY
RCDAE/SY
RCD/SY
RCDSA/IS
RCDSY/IS
RCDAE/IS
RCD/IS
RCDAE/AT
RCD/AT
RCD/AS
SNMI/AD
SNM/SY
SNM/RS
CPM/PT
DDB/PT
DDB/SY
NEU/HT
NEU/PT
NEU/XX
NEU/SY
UWDA/PT
UWDA/SY
UMD/PT
UMD/ET
UMD/RT
MMSL/CD
MMSL/BD
MMSL/SC
MMSL/MS
MMSL/GN
MMSL/BN
MMSL/IN
MTHFDA/CD
NDDF/CD
NDDF/IN
SPN/PT
MDRAE/HG
MDR/HG
MDREA/HG
MDREX/HG
MDRAE/PT
MDR/PT

MDREA/PT
MDREX/PT
MDR/OS
MDRAE/HT
MDR/HT
MDREA/HT
MDRAE/SC
MDREX/HT
MDR/SC
MDRAE/LT
MDR/LT
MDREA/LT
MDREX/LT
CST/PT
WHO/OS
WHO/HT
WHO/PT
WHO/IT
AIR/HT
AIR/FI
AIR/DI
AIR/SY
ULT/PT
CPT/PT
CPT/SY
CPT/MP
HCPT/PT
HCPCS/PT
CDT/PT
HCDT/PT
HCPCS/MP
HCPT/MP
ICD10AE/PT
ICD10/PT
ICD10AE/PX
ICD10/PX
ICD10AE/PS
ICD10/PS
ICD10AMAE/PT
ICD10AM/PT
ICD10AMAE/PX
ICD10AM/PX
ICD10AMAE/PS
ICD10AM/PS
PDQ/PT
PDQ/SY
NCI/PT
NCI/SY
NCI/AB
ICPC2AE/PT
ICPC2E/PT
ICPC2AE/PX
ICPC2E/PX
ICPC/PX
ICPC/PT
ICPC2AE/PS

ICPC2E/PS
ICPC2AE/ET
ICPC2E/ET
ICPC/PS
ICPC/PC
ICPC/CX
ICPC/CP
ICPC/CS
ICPC/CC
ICPC2E/CO
ICPC/CO
ICPC2AE/AB
ICPC2E/AB
CCPSS/TX
CCPSS/TC
CCPSS/PT
CCPSS/MP
ICPCPAE/SF
ICPCPAE/SY
ICPC2P/SF
ICPC2P/SY
ICPCPAE/PX
ICPC2P/PX
ICPCPAE/PT
ICPC2P/PT
ICPCPAE/PS
ICPC2P/PS
AOD/DE
AOD/DS
AOD/XD
AOD/FN
AOD/ET
AOD/ES
AOD/EX
AOD/NP
AOD/NS
AOD/NX
HCPCS/OP
CDT/OP
HCDT/OP
HCPT/OP
HCPCS/OM
HCPT/OM
GO/PX
GO/PT
GO/PS
GO/EX
GO/ET
GO/SS
JABL/PC
JABL/PT
JABL/SS
JABL/SY
MIM/PT
PDQ/RT
NCBI/USN

NCBI/SCN
NCBI/USY
NCBI/SY
NCBI/UCN
NCBI/CMN
NCBI/EQ
BI/PT
BI/SY
BI/RT
LNC/LX
LNC/LN
LNC/LO
LNC/OSN
LNC/CX
LNC/CN
LNC/SX
LNC/SN
LNC/LS
DSM4/HT
DSM3R/HT
SNM/HT
ICD9CM/PT
MDRAE/OL
MDR/OL
MDREX/OL
ICD9CM/HT
CCS/HT
CCS/MD
CCS/SD
CCS/MV
CCS/SP
ICD10AE/HT
ICD10/HT
ICD10AE/HX
ICD10/HX
ICD10AE/HS
ICD10/HS
ICD10AMAE/HT
ICD10AM/HT
UMD/HT
ICPC/HT
RAM/PT
RAM/RT
QMR/PT
HL7/PT
HL7/DF
HL7/DFA
HL7/ET
HL7/VS
MTHCH/HT
MTHHH/HT
HHC/DX
BI/AB
HHC/IV
HHC/CO
NIC/IV

NIC/HC
NAN/PT
NAN/HT
NAN/RT
OMS/MT
OMS/PR
OMS/TG
OMS/HT
OMS/PQ
OMS/IV
OMS/SI
NIC/AC
NIC/SA
NOC/OC
NOC/IX
NOC/ID
PCDS/GO
PCDS/OR
PCDS/PR
NIC/HT
NOC/HT
NOC/HC
HHC/MP
PCDS/CO
PCDS/HX
PCDS/HT
COSTAR/PT
DXP/DI
DXP/FI
DXP/SY
MCM/PT
MCM/RT
PPAC/DO
PPAC/CL
PPAC/AC
PPAC/ST
PPAC/TA
ALT/PT
ALT/SY
ALT/HT
MTH/PT
MTH/SY
MTH/RT
DSM3R/SY
DSM3R/RT
MTHICD9/ET
CST/SC
CST/HT
CST/GT
PSY/PT
PSY/HT
PSY/ET
MTHMST/PT
MTHMST/SY
LCH/PT
MSH/HT

MSH/HS
MSH/PM
RCDSA/AB
RCDSY/AB
RCDAE/AB
RCD/AB
RCDSA/OA
RCDSY/OA
RCDAE/OA
RCD/OA
RCDAE/AA
RCD/AA
CSP/PT
CSP/SY
CSP/ET
MTH/DT
BRMP/MH
BRMS/MH
DUT/MH
DMD/MH
FIN/MH
INS/MH
ITA/MH
RUS/MH
BRMP/SY
BRMS/SY
DUT/SY
DMD/SY
INS/SY
ITA/SY
RUS/SY
BRMP/EP
BRMS/EP
DUT/EP
DMD/EP
DMDUMD/PT
DMDUMD/ET
DMDUMD/RT
WHOFRE/OS
WHOGER/OS
WHOPOR/OS
WHOSPA/OS
MDRSPA/HG
MDRSPA/HT
MDRSPA/OS
MDRSPA/PT
MDRSPA/SC
MDRSPA/LT
MDRSPA/OL
MDRPOR/HG
MDRPOR/HT
MDRPOR/OS
MDRPOR/PT
MDRPOR/SC
WHOFRE/HT
WHOGER/HT

WHOPOR/HT
WHOSPA/HT
WHOFRE/PT
WHOGER/PT
WHOPOR/PT
WHOSPA/PT
WHOFRE/IT
WHOGER/IT
WHOPOR/IT
WHOSPA/IT
CPTSP/PT
DMDICD10/PT
DMDICD10/HT
ICPCBAQ/PT
ICPCDAN/PT
ICPCDUT/PT
ICPCFIN/PT
ICPCFRE/PT
ICPCGER/PT
ICPCHEB/PT
ICPCHUN/PT
ICPCITA/PT
ICPCNOR/PT
ICPCPOR/PT
ICPCSPA/PT
ICPCWE/PT
ICPCBAQ/CP
ICPCDAN/CP
ICPCDUT/CP
ICPCFIN/CP
ICPCFRE/CP
ICPCGER/CP
ICPCHEB/CP
ICPCHUN/CP
ICPCITA/CP
ICPCNOR/CP
ICPCPOR/CP
ICPCSPA/CP
ICPCWE/CP
MTHMSTFRE/PT
MTHMSTITA/PT
SRC/RPT
SRC/RHT
SRC/RAB
SRC/RSY
SRC/VPT
SRC/VAB
SRC/VSY
SRC/SSN

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B.6 Source Specific Relationship Attributes Not Listed in the Semantic Network

Currently, definitions for these relationship attributes are not provided.

actual_outcome_of
adjectival_form_of
classified_as
classifies
clinically_associated_with
clinically_similar
closest_related_pdq_diagnosis
ddx
default_mapped_from
default_mapped_to
dose_form_of
expected_outcome_of
form_of
has_actual_outcome
has_closest_related_pdq_diagnosis
has_dose_form
has_expected_outcome
has_form
has_member
has_tradename
has_translation
has_version
icd_asterisk
icd_dagger
mapped_from
mapped_to
member_of_cluster
modified_by
modifies
multiply_mapped_from
multiply_mapped_to
noun_form_of
other_mapped_from
other_mapped_to
primary_mapped_from
primary_mapped_to
sib_in_branch_of
sib_in_isa
sib_in_part_of
sib_in_tributary_of
ssc
tradename_of
translation_of
uniquely_mapped_from
uniquely_mapped_to
version_of

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Last updated: 12 November 2003